

JPRS-EEI-85-098

29 DECEMBER 1985

# East Europe Report

ECONOMIC AND INDUSTRIAL AFFAIRS



FOREIGN BROADCAST INFORMATION SERVICE

#### NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [ ] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

#### PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

## **NOTICE**

Effective 1 January 1986, JPRS will combine all material on East Europe in a new report, entitled EAST EUROPE REPORT, with the trigraph EER. Contained in the new report will be all material previously published in the following three JPRS reports, which will be discontinued:

EAST EUROPE REPORT: ECONOMIC AND INDUSTRIAL AFFAIRS  
EAST EUROPE REPORT: POLITICAL, SOCIOLOGICAL, AND MILITARY AFFAIRS  
EAST EUROPE REPORT: SCIENCE AND TECHNOLOGY

Subscribers who received any of these three reports prior to 1 January 1986 will automatically receive the new EAST EUROPE REPORT.

To change their subscription, U.S. Government subscribers should notify their distribution contact point. Non-government subscribers should contact the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161.

29 December 1985

# EAST EUROPE REPORT

## ECONOMIC AND INDUSTRIAL AFFAIRS

### CONTENTS

#### INTERNATIONAL AFFAIRS

Economic Plans of CEMA Countries Viewed (Andras Inotai; HETI VILAGGASDASAG, 12 Oct 85) .....	1
Yugoslav-USSR Commodity Trade Lists for 1984 (MEDJUNARODNI UGOVORI, No 10, 31 Jul 85) .....	5

#### GERMAN DEMOCRATIC REPUBLIC

Development, Practices of Planned Economy Discussed (Otto Reinhold; EINHEIT, No 11, Nov 85) .....	16
Scientific Progress, Structural Economic Change Linked (Helmut Koziolk; EINHEIT, No 11, Nov 85) .....	25
Comparison Between Combines, Goal Setting Emphasized (Willi Kunz, Wolfgang Salecker; EINHEIT, No 11, Nov 85) .....	36
Technological Development, Industrial Benefits Cited (Siegfried Schiller; EINHEIT, No 11, Nov 85) .....	43
Combine Operations, Effectiveness Detailed (Hans-Joachim Beyer; EINHEIT, No 11, Nov 85) .....	49
FRG Daily Assesses Economic Innovation Potential (Hans Herbert Goetz; FRANKFURTER ALLGEMEINE, 4 Dec 85) .....	54
Natural Gas Fuel-Substitution Studied, Used in Motor Vehicles (Gert Walter; ENERGIETECHNIK, No 5, May 85) .....	57
INTERFLUG Passenger Volume, Operational Costs Detailed (Eberhard Lein; TECHNISCH-OEKONOMISCHE INFORMATION DER ZIVILEN LUFTFAHRT, No 5, 1985) .....	65
Industrial Emissions Cause Large-Scale Damage to Forests (Horst Paucke; SPEKTRUM, No 6, 1985) .....	74



Conditions Limit Prospects for Steel Production Technology (Ludwig Ruschitzka; GIESSEREITECHNIK, No 6, Jun 85) .....	80
Modernization Seen as Main Goal in Transport Industry (Otto Arndt; DDR-VERKEHR, No 9, Sep 85) .....	93
Improved Economic Analysis Aids Agricultural Management (KOOOPERATION, No 6, 1985) .....	99
Managerial Requirements Considered, by Bruno Forebe	99
Statistical Data Emphasized, by Helmut Klaus	108
Structural Changes, Productivity in Farm Sector Assessed (Karl Hohmann; FS-ANALYSEN, No 6, 1984) .....	117
Chemical, Organic Fertilizers, Irrigation Increase Soil Quality (FELDWIRTSCHAFT, No 8, Aug 85) .....	136
Organic Fertilizers Emphasized, by K. H. Braun	136
Crop Yields Analyzed, by K. Ressel, et al.	143
Fall Planting Guided by Analysis of 1985 Planting Season (Dieter Ebert Interview; BAUERN-ECHO, 4 Sep 85) .....	148
Guide, Travel Lanes Deemed Practical in Fertilizer Application (R. Otto, et al.; FELDWIRTSCHAFT, No 6, Jun 85) .....	152
Improperly Applied Fertilizer Results in Deficient Crop Yield (Klaus Kampfe, Lothar Hannusch Interview; DEUTSCHE BAUERNZEITUNG, No 13, 29 Mar 85) .....	160

#### HUNGARY

State Secretary on Aims of Seventh 5-Year Plan (Janos Hoos Interview; NEPHADSEREG, No 44, 2 Nov 85) ....	165
State Secretary Discusses Price System (Bela Szikszay Interview; MAGYAR HIREK, No 21, 12 Oct 85)	169
Employment, Work-Force Problems, Solutions Weighed (Csaba Vertes; FIGYELO, 17 Oct 85) .....	176
External Economic Situation, Inflation Discussed (Istvan Hagelmayer; MAGYAR NEMZET, 5 Nov 85) .....	181
Foreign Trade Results in First Three Quarters Noted (Gyorgy Pataki; FIGYELO, 31 Oct 85) .....	185
Adjustment of Legal Measures to Development of Society Discussed (Imre Markoja; MAGYAR NEMZET, 17 Sep 85) .....	188

Official Clarifies Role of Agricultural Co-op Activities (Janos Eleki Interview; OTLET, 3 Oct 85) .....	192
--	-----

## POLAND

Details on 1986 Annual Plan (RZECZPOSPOLITA, 26 Nov 85) .....	198
Planning Commission on 1986-90 Fuel, Energy Supplies (RZECZPOSPOLITA, 20 Nov 85) .....	200
Natural Gas Consumption, Supply Outlook (TRYBUNA LUDU, 18 Nov 85) .....	202
Railway Car Bottleneck Causes Examined (Andrzej Kozminski; TRYBUNA LUDU, 25 Oct 85) .....	204
Briefs	
Soviet Rail Equipment to Poland	208
Polish-Japanese Trade Talks	208

## ROMANIA

Status of Production, Exports in Chemical Industry (Ioan Georgescu; REVISTA ECONOMICA, No 41, 11 Oct 85) ....	209
Technologies for Increased Use of Reusable Resources (Ioan Nedelcu; REVISTA ECONOMICA, No 41, 11 Oct 85) .....	213
Increased Production in Wood Industry (Rodica Miroiu; REVISTA ECONOMICA, No 41, 11 Oct 85) .....	215
Measures To Increase Poultry Production (Viorel Chirita, Gheorghe Olteanu; REVISTA ECONOMICA, No 41, 11 Oct 85) .....	218

## YUGOSLAVIA

Slovene LC Forum Discusses Economy, LC Membership (TANJUG Domestic Service, 13 Nov 85) .....	222
Briefs	
Mining Production Figures	224
New Home Computer Production	224
New Air Routes	224
Irrigation Equipment for Syria	225
Egyptian Economic Cooperation	225
Bosnia-Herzegovina Industrial Production	225
Electronic Industry Expansion	225
Italian-Yugoslav Economic Cooperation	226
Debt to Belgium Rescheduled	226
Yugoslav-French Economic Cooperation	226

ECONOMIC PLANS OF CEMA COUNTRIES VIEWED

Budapest HETI VILAGGAZDASAG in Hungarian 12 Oct 85 pp 4-5

[Article by Andras Inotai: "Growth or Balance?"]

[Text] To speed up economic growth at the expense of external balance or to guard economic stability while sacrificing the dynamics of development? At the threshold of the new five year plan period starting in 1986 economic planners from several smaller CEMA countries are facing this dilemma. Relying on writings by socialist economists, the author of this article claims that the apparent contradiction between growth and balance could be mitigated by external reforms and further developing management systems.

Particular attention is nowadays focused on the economic growth of European CEMA countries, the development of the important branches of production, and the ubiquitously discussed efforts to achieve balance. This is happening partly because we are in the last year of the 1981-1985 plan period, when it is more or less decided what has been accomplished of mid-range objectives, where we have succeeded in taking a significant step forward, and where we have experienced tension. Results and problems of this time period strongly influence the definition of objectives for the 1986-1990 five year plan.

The growth rate of the economies of socialist countries and their industrial production slowed down in the beginning of the eighties. 1983 and 1984 showed some increased activities which were related to a general boom in world economy. As a result of strict import and investment restrictions and efforts to increase export the western currency foreign trade balance of most CEMA countries has improved. At the same time, bad weather conditions caused significant crop losses in the majority of small CEMA countries. Particularly the severe winter of last year resulted in much backlog, and it remained for the second part of this year to make up for it.

The advent of the new five year plan period as well as the seemingly successful handling of previous severe problems contributed to the survival of the quantity viewpoint, and so the acceleration of growth has become the central task for the next period in practically all European CEMA countries. In Poland the 1983-1985 plan for consolidation has been considered the foundation of a strong boom. Along with the ever ambitious plans for the economic development in Rumania, now the GDR's economists as well consider

accelerated growth well founded and an organic part of the socialist economic system.

With a knowledge of this background it is not in our interest to find an answer to the following questions:

-Does the slight acceleration of economic growth in the European CEMA countries in 1983-1984 promise to be lasting, and if so, how lasting?

--Do the CEMA countries have the internal economic structure and productivity to secure an external balance in the time period of growth acceleration?

-With their background of export structure, quality and productivity, will CEMA countries be successful in taking advantage of the economic strengthening of the western world?

-Can the economic losses sustained by several socialist countries last winter be considered a temporary, one-time event, or do we have to count on their reoccurrence?

Results of this year so far indicate that the process of accelerated growth has come to a halt in the CEMA region. An exception is the GDR, where, according to a report by the Berlin Bureau of Statistics, the produced GNP stays barely behind directives that are slightly higher than those for the year 1984, and industrial production is well above planned. In the Soviet Union, the boom that has been observed since spring brought an end to the backlog in several areas, but there is still a lot to be made up for even in key areas like oil and steel production, and several branches of the processing industry. According to preliminary estimates the results in agriculture are going to be better than last year, and experts figure that after last year's 50 million tons of grain import the country will have to buy from abroad a few million tons less this year.

According to preliminary data, the GNP in Poland grew by 2 percent in the first half of 1985 instead of the planned 3.3-3.5 percent, and industrial production grew by 2.2 percent instead of 4.0-4.5 percent. Statistics indicate that Czechoslovakia is closer to fulfilling its annual plan, even though it, too, experiences some discrepancies, particularly in quality. We do not have statistical data from Rumania, but recent measures to accelerate industrial production and increase public works indicate that they are significantly behind original expectations. Central price increases were announced recently in Bulgaria, where the energy shortage has caused serious concerns, and drought has dealt a strong blow to agriculture, one of the pillars of foreign trade and economy.

From all this the planners in socialist countries conclude that -- although the countries in question are going to make substantial efforts in the rest of the year to make up for a portion of the losses and discrepancies -- the actual growth of the CEMA region is going to stay behind plans, and for many indicators it is not even going to reach the results of the years 1983 and 1984.



Meanwhile some smaller CEMA countries found it necessary to bring in supplementary raw material and energy, and paralleling this they lost important export opportunities. All this had a negative effect on these countries' plans for their foreign trade balance, particularly for the dollar balance. In the east-west trade the ratio of raw materials has further increased: one could observe in previous years that sales of raw material and energy by socialist countries exceeded more and more sales of manufactured products, due to these products' problems with competition and marketability. A new phenomenon is that small socialist countries' material and energy purchases from the west seriously drain their available currency that could be used for the development and modernization of their machine industry.

A large number of exporters in socialist countries could not take advantage of the boom on western markets. However, it is true that the national currencies of the United States' most important capitalist trading partners were depreciated compared to the very strong dollar in the first half year, and this move decreased these countries' foreign trade output when figured in dollars. This also played a role in the fact that socialist countries' western export, figured in dollars, stayed mostly behind the same period of 1984. But their export was disproportionately lower than could be explained by the appreciation of the dollar; it was on the average 10-25 percent below the level of the same time period last year.

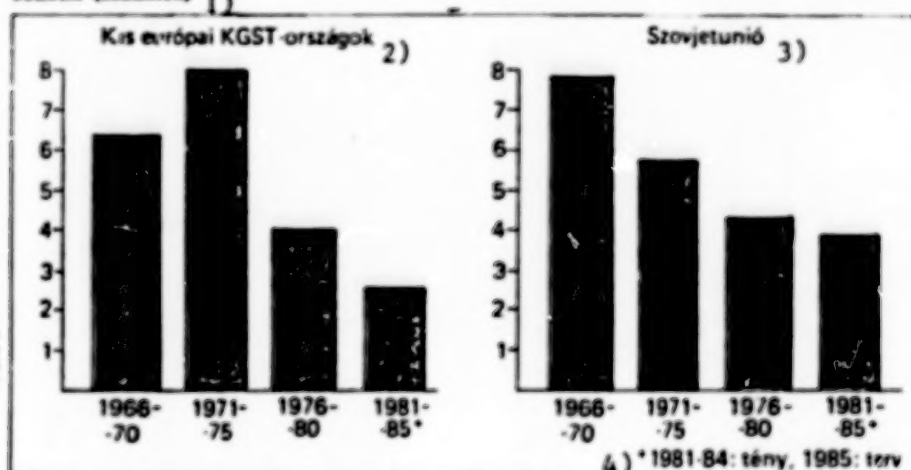
The unusually severe winter caused substantial losses everywhere. But behind crop losses there is a whole row of management problems. The Polish newspaper TRYBUNA LUDU warned in an editorial recently: we should not constantly refer to last year's severe winter. The Sophia RABOTNICHESKO DELO drew attention to the fact that it is not the weather but the poor use of work hours and the car park's occasional 70 percent downtime that are the main causes of loss. The Chief Secretary of the Central Committee of the Soviet Communist Party, Gorbachev, recently exposed those who bring up the excuse of objective hindrances and weather difficulties when held responsible for not achieving plan objectives.

As we near the end of the year more and more articles in the press of socialist countries warn us: the economic balance of CEMA countries is still vulnerable to numerous factors of uncertainty, and this is primarily not due to external reasons. It seems that in a great number of CEMA countries the internal forces of an economic upswing can only function in the traditional model. This is precisely why development is made more difficult by the more and more restricted and expensive raw material and energy supply, and by the danger of losing the external balance.

The sources of the primary ways of saving energy have diminished practically in most CEMA countries, and the industrial structure has in general stayed extraordinarily energy-intensive. In many cases the reason for falling behind in export is not to be sought in the strength of the economy; it is the ever growing discrepancy between production supply and foreign demand that hinders successful sales abroad. It seems therefore that in most of the CEMA countries a change in the industrial structure and a strong improvement in international marketability are not going to take place now.

From the economic output of many CEMA countries in recent months and their measures to correct emerging problems it is clear that the main issue in reality is not a choice between a strategy to accelerate growth and to keep stability. The past ten years have shown us the limits of both strategies. These occurred independently of the strategy, objectively, as a function of their application in an unchanged economic structure. Therefore substantial changes and a long-range boom can only be expected -- as it has been increasingly pointed out by economists in socialist countries -- by switching to an intensive economy and introducing internal reforms.

A KGST-országok nemzeti jövedelmének átlagos évi növekedése az öt éves tervperiódusokban (százalék) 1)



Key: 1. Average Annual Growth of the National Income of CEMA Countries  
 2. Small European CEMA Countries  
 3. Soviet Union  
 4. +1981-84: Fact, 1985: Plan

12925/12366  
 CSO: 2500/79

## YUGOSLAV-USSR COMMODITY TRADE LISTS FOR 1984

Belgrade MEDJUNARODNI UGOVORI in Serbo-Croatian No 10, 31 Jul 85 pp 375-381

[Commodity lists from protocol concluded in Belgrade, 18 January 1984]

[Text] List 1. Goods To Be Delivered From the USSR to the SFRY in 1984

<u>No</u>	<u>Commodity Designation</u>	<u>Quantity or Value</u>
1	Metal-cutting machine tools conforming to an agreed specification	185 units
2	Forging and pressing equipment conforming to an agreed specification	59 "
3	Woodworking machines	25 "
4	Spare parts for machines for cutting, shaping and working wood	600 thousands of dollars
5	Accessories and spare parts for power engineering equipment	1,000 "
6	Electrical engineering equipment	1,550 "
7	Continuous miners	2 units
8	Miscellaneous mining equipment, including health and safety equipment and spare parts	175 thousands of dollars
9	Deliveries of draglines under cooperative arrangements:	
	ESH-6/45	3 units*
	ESH-10/70A	1 unit
10	Drilling rigs:	
	1 BA-15 N	4 units
	UKB-500 S	2 "
	SKB-4 D	2 "
11	Equipment for deparaffinization of oil wells PPUA 1200/100	2 "
12	Pumping unit 1 NP-15	4 "
13	Overhead traveling crane	1 unit
14	Gantry and portal cranes	5 units**

\* Possibility open for an increase.

\*\* Under condition of agreed specification.



## List 1 (continued)

<u>No</u>	<u>Commodity Designation</u>	<u>Quantity or Value</u>
15	Truck cranes: KS-3571, with a capacity of 10 tons, telescopic boom	5 units
	KS-4571, with a capacity of 16 tons	5 "
16	MZ T-130 and T-100 tractor-mounted bull- dozers	15 "
17	Miscellaneous roadbuilding machines	500 thousands of dollars
18	Spare parts for cranes and roadbuilding machines	500 thousands of dollars
19	Self-propelled graders, 250 HP	2 units
20	Scrapers, self-propelled, Model D-357 P, volume 8 m <sup>3</sup>	2 "
21	Excavators: EKG-3 A	2 "
	ETC-165	6 "
	EO-2621A	3 "
	E-10011 E	4 "
	E-304 G	5 "
	EO-5112 A	2 "
22	Spare parts for excavators	1,000 thousands of dollars
23	Equipment for the food processing industry	300 "
24	Equipment for the leather and footwear in- dustry	400* "
25	Shuttleless looms	200 units
26	Equipment for the textile industry and light industry, including spare parts	2,500 "
27	Miscellaneous equipment for the chemical industry	200 thousands of dollars
28	Paper manufacturing equipment	750 "
29	Medical equipment	900 "
30	Equipment for compressors and refrigeration	500 "
31	Oxygen-cryogenic equipment	500 "
32	KAMA and MALISH pumps	15,000 units
33	Equipment for the printing industry, in- cluding spare parts	1,500 thousands of dollars
34	Equipment for the trade sector and food service industry	450 "
35	Active and passive components	3,200 "
36	Electrical and radio measuring devices, etc.	540 "
37	Black-and-white TV picture tubes	100,000 units*
38	Rolling-element bearings	8,000 thousands of dollars
39	Electrical perforators	120 "
40	Measuring tools for wood and metal cutting	1,000 "
41	Abrasive tools and electroboron tools	500 "

\* Possibility open for an increase.

## List 1 (continued)

<u>No</u>	<u>Commodity Designation</u>	<u>Quantity or Value</u>	
42	Diamond tools, industrial diamond dust, tools made with polycrystals	2,000	thousands of dollars
43	Crawler tractors:		
	TDT-55 A	5	units
	T-130	5	"
44	Spare parts for tractors	9,500	thousands of dollars
45	Agricultural machines:		
	KSP-15 B potato grading stations	5	units
	Model KSK-100 tractor-drawn forage- cutting combines	5	"
	KTU-10 livestock feeders	20	"
	KKS-6 combines for harvesting castor beans	10	"
	KSKU-6 cornpickers	5	"
	LKV-4A flax-harvesting combines	5	"
	Miscellaneous agricultural machines	700	thousands of dollars
46	Spare parts for agricultural machines	400	"
47	Trolleybuses	23	units
48	Spare parts for trolleybuses	150	thousands of dollars
49	Electric motor trains, Model ER-31	8	units*
50	Accessories and spare parts for the rail- roads	600	thousands of dollars
51	RO-RO vessel with a capacity of 5,500 tons (design 16,073)	1	unit
52	Hydrofoil passenger vessel, "Albatros" series	1	"
53	Passenger vessel, "Moskva" series (design R-51 E)	1	"
54	Hydrofoil passenger vessel, "Vaskhod" series	1	"
55	Marine equipment and spare parts	9,000	thousands of dollars
56	Aviation needs, motors, spare parts and general repairs	7,200	"
57	BELAZ-540 and 548 trucks	30	units
58	Passenger automobiles:		
	VAZ-469 B	300	"
	VOLGA	100	"
	MOSKVICH LUKS	250**	"
	MOSKVICH IZH-27151, 0.8 ton	200**	"
59	Spare parts for passenger vehicles and trucks (not including those for VAZ)	10,000	"

\* With delivery of one unit in 1985.

\*\* Possibility open for an increase.

## List 1 (continued)

<u>No</u>	<u>Commodity Designation</u>	<u>Quantity or Value</u>
60	Deliveries on the basis of cooperative arrangements:	
	Counter trade for assemblies and parts for VAZ passenger automobiles:	
	VAZ passenger automobiles	20,000 units*
	Spare parts for VAZ passenger automobiles	5,000 thousands of dollars
	Counter trade for sets of parts for KAMAZ trucks:	
	KAMAZ truck chassis	550 units
	Truck chassis:	
	KRAZ-6504	250 "
	MAZ-5432, 6422	22** "
61	Miscellaneous machines and equipment	
62	Coking coal--blast furnace charge	2,600 thousands of tons
63	Anthracite	200 "
64	Petroleum	5,500 "
65	Kerosene for lighting	55 "
66	Gas oil	510 "
67	Furnace oil	800 "
68	Petroleum coke	15 "
69	Mineral oils and lubricants	10 "
70	Creosote oil	11 "
71	Natural gas	3,500 millions of m <sup>3</sup>
72	Electric power	100 millions of kwh
73	Iron ore (concentrate)	320 thousands of tons
74	Manganese ore	40 "
75	Chromium ore	55 "
76	Asbestos	32 "
77	Cement	100 "
78	Apatite, concentrate, 39.4% P <sub>2</sub> O <sub>5</sub>	25 "
79	Kaolin	10 "
80	Pig iron	100*** "
81	Steel scrap	100 "
82	Semifinished products, rolled and drawn products of ferrous metallurgy	181.7 "
83	Exchange of products of ferrous metallurgy	130,000 thousands of dollars
84	Tinplate	4 thousands of tons
85	Cold-rolled strip	3 "
86	Nickel	2.2 "
87	Aluminum:	
	Including 10,000 tons for the cable industry	40 "

\* Quantities to be determined by contract.

\*\* Possibility open for an increase.

\*\*\* With the option of substitution of steel waste--scrap iron.

## List 1 (continued)

No	Commodity Designation	Quantity or Value
88	Beryllium	400 kg
89	Zirconium	250 "
90	Chromium oxide	900 tons
91	Potassium bichromate	500 "
92	Potassium ferrocyanide	400 "
93	Calcium chloride	500 "
94	Lithium hydroxide	200 "
95	Toluene	3,000 "
96	Vinyl chloride	10,000 "
97	Carbon disulfide	2,500 "
98	Boric acid	500 "
99	Xylene	2,500 "
100	Copper sulfate	1,000 "
101	Nickel sulfate	50 "
102	Potash (100%)	600 "
103	Coumarone resin	125 "
104	Butyl alcohol	1,500 "
105	Isobutyl alcohol	7,000 "
106	Isopropyl alcohol	1,000 "
107	Sodium sulfate	5,000 "
108	Red phosphorus	50 "
109	Sodium bichromate	2,500 "
110	Borax	200 "
111	Ethyl benzene	2,000 "
112	Acetone	1,000 thousands of tons
113	Butyl acetate	500 "
114	Organic and synthetic pigments	2,500 thousands of dollars
115	Dibasic ammonium phosphate	300 tons
116	Ammonia	75,000 "
117	Styrene monomer	10,000 "
118	Polyethylene, high-density	600 "
119	Chemicals for plant pest and disease control	1,800 thousands of dollars
120	Miscellaneous chemical products	2,000 "
121	Potassium fertilizers (60% K <sub>2</sub> O)	300 thousands of tons
122	Ammonium sulfate (20.5% N)	100 "
123	Carbamide (urea) (46.1% N)	65,000 "
124	Synthetic rubber	25 "
125	Tires	4,000 thousands of dollars
126	Softwood pulp (stacked)	800 thousands of m <sup>3</sup>
127	Softwood lumber	200 "
128	Paper pulp	60 thousands of tons
129	Paper wire and cable insulation	2 "
130	Cotton	70 "
131	Pickled swine skins	200,000 units
132	Seed and nursery stock	10,000 thousands of dollars

## List 1 (continued)

<u>No</u>	<u>Commodity Designation</u>	<u>Quantity or Value</u>
133	Pharmaceutical raw materials and drugs	5,000 thousands of dollars*
134	Salt for food processing	20 thousands of tons
135	Consumer goods:	
	Bicycles	30,000 units
	Spare parts for television sets	60 thousands of dollars
	Dishware and tableware	2,000 "
	Timepieces	300,000 units
	Spare parts for timepieces	30 thousands of dollars
	Alarm clock movements	100,000 units
	Cameras	8,000 "
	Camera accessories	120 thousands of dollars
	Movie cameras	3,000 units
	Musical instruments	500 thousands of dollars
	Recreational hunting weapons and recreational fishing tackle	2,700 "
	Sporting goods	400 "
	Camping equipment	1,000 "
	Handicrafts	170 "
	Toys	1,000 "
	School supplies	110 "
	Miscellaneous binoculars and telescopes	15,000 units
136	Newspapers, philatelic articles, phonograph records	730 thousands of dollars
137	Films	950 "

\* Quantities to be determined by contract.

## List 2. Goods To Be Delivered From the SFRY to the USSR in 1984

<u>No</u>	<u>Commodity Designation</u>	<u>Quantity or Value</u>
1	Universal milling machines (table width 200-400 mm)	80 units
2	Universal and special grinders	72 "
3	Other metal-cutting machine tools	100 "
4	Devices for programming and numerical indication for machine tools	2,000 thousands of dollars
5	Numeric control assemblies for the Ryazan plant	2,800 "
6	High-speed spindles for internal grinding	1,000 "
7	Mobile hydraulic baling presses, with a force of 120 tons	80 units
8	Open one-way and two-way mechanical presses, with a force of 125-500 tons (160-400 tons)	50 "
9	Single-stage hydraulic presses, with a force of 10-250 tons	98 "

## List 2 (continued)

<u>No</u>	<u>Commodity Designation</u>	<u>Quantity or Value</u>
10	Double-action enclosed cam presses, with a force of 100-1,250 tons	30 units
11	Hydraulic apkant hydraulic presses with a force of 160-600 tons	20 "
12	Shears for cutting section steel, 315-1,600 tons	40 "
13	Hydraulic guillotine shears, 20-32 mm	20 "
14	"Raster" high-speed mechanical automatic presses	40 "
15	Pneumatic friction clutches for presses	12,000 "
16	Tools for presses	1,250 thousands of dollars
17	Spare parts for machine tools, forging equipment and presses	2,000 "
18	Equipment for warehouses	2,400 "
19	Oil transformers from 100 kVA to 1,600 kVA, up to 35 kv	240 MVA
20	Electrical equipment for voltages 12-20 kv	2,000 thousands of dollars
21	Electrical packet-comb switches	2,000 "
22	High-voltage insulators	2,000 "
23	Marine diesel units, 980 kw	5 units
24	Micromotors for electroporators	120 thousands of dollars
25	Delivery of assemblies and parts for drag-lines on the basis of cooperative arrangements:	
	ESh-6/45M	36 units*
	ESh-10/70A	40 "
26	Metallurgical equipment	9 thousands of tons
27	Press molds for pressure casting machines	28 units**
28	Spare parts for electric tractors and electric forklift trucks	120 thousands of dollars
29	Chain conveyor with a capacity of 175 tons/hr	200 units
30	Bakery ovens with wire screen floor, area 50-100 m <sup>2</sup>	5 "
31	Complete equipment for small bakery	600 thousands of dollars
32	Equipment for the production of cookies and crackers	300 "
33	Machine for packing cookies into boxes	50 units
34	Tomato paste production line P-300-800 tons for 24-hour operation (completion of deliveries)	16,500 thousands of dollars
35	Tomato paste production line P-300-800 tons for 24-hour operation (beginning of deliveries)	14,100 "

\* Quantities to be determined by contract.

\*\* Including completion of deliveries in 1985.



## List 2 (continued)

<u>No</u>	<u>Commodity Designation</u>	<u>Quantity or Value</u>
36	Production line for aseptic preservation of semifinished products	1 line
37	Tunnel drier, Model "CER"	5 units
38	Production line for poultry slaughtering and processing	1 line
39	Vacuum evaporators for condensing milk	units
40	Stainless steel fittings for milk pipelines	1,500 thousands of dollars
41	Complete line for producing dried mash potatoes	1 line
42	Lines for cleaning and peeling potatoes	12 lines
43	Heaters using liquid or gaseous fuel	1 unit
44	Complete equipment for the processing of powdered eggs	6 sets
45	Spare parts:	
	For the baking industry	1,400 thousands of dollars
	For the canning industry	1,400 "
	For the livestock feed industry	1,300 "
	For the sugar industry	1,000 "
	For the dairy industry	170 "
46	Equipment for the footwear industry	10,000 "
47	Spare parts for equipment of light industry	300 "
48	Equipment for "Universam" department stores	1,700 "
49	Saws for cutting bones	500 units
50	Pressure cookers, 300 liters	1,000 "
51	Automatic telephone switchboards under special order	30,000 thousands of dollars
52	ARM-20 intercity telephone exchange with spare parts	10,600 "
53	City telephone office with spare parts	20,000 "
54	Intercity regional office	7,000 "
55	Automatic telephone switchboards for 4,000 numbers	1,000 "
56	Spare parts for automatic telephone switchboards	350 "
57	Automatic Telex telegraph terminals with kits, instruments, accessories, cables and spare parts	6,100 "
58	UHF/VHF channels with keyboard and sensors	5,000 "
59	Special technological equipment and gear according to an agreed nomenclature for the communications equipment industry	4,000 "
60	"Traveler" portable typewriters	3,500 "
61	Medical equipment, including units, assemblies and parts for X-ray machines	4,800 "
62	Industrial reinforcing steel	26 thousands of tons
63	"Pruver" turbopiston devices	17 sets
64	Prefabricated metal structures with panels	27,000 thousands of dollars



## List 2 (continued)

No	Commodity Designation	Quantity or Value
65	Metal-cutting tools	1,400 thousands of dollars
66	Rolling-element bearings	3,000 "
67	Abrasive products	700 "
68	Spare parts for agriculture, including semerinzi and chains for combines	11,000 "
69	Vibrating rollers with spare parts	200 units
70	Centrifugal clutches to drive generators beneath railroad cars	250 "
71	Tankers for hauling crude petroleum and petroleum products with a capacity of 15,000-18,000 tons	5* "
72	Passenger vessels with a capacity of 50-74 passengers to service floating facilities up to 100 miles from shore	4 "
73	Railroad car vessel for the Caspian Sea with a capacity between 3,000 and 4,000 tons	2 "
74	Tugboats, capacity 2,300 HP	5* "
75	Tugboats for moving drilling platforms with a capacity of 5,000 HP	1 "
76	Pushboats, marine, 600 HP	3 "
77	Platform service vessels, 4,200 HP	1 "
78	Pleasure craft	140 thousands of dollars
79	Ship firefighting equipment	10,000 "
80	Marine equipment and supplies	1,200 "
81	Marine equipment and spare parts for re- pairing vessels	6,500 "
82	Vessel repairs	28,000** "
83	Deliveries under cooperative arrangements:	
	Assemblies and parts to complete VAZ passenger automobiles	55,700*** "
	Assemblies and parts to complete KAMAZ trucks	68,500 "
84	Kits for MOSKVICH LUKS passenger automo- biles	12,800 "
85	Semitrailers--tanks for carrying petroleum products	100 units
86	Spare parts for tank trucks	200 thousands of dollars
87	Lead storage batteries, automotive and in- dustrial	54,100 "
88	Storage batteries and nickel-cadmium bat- teries for railroad cars and locomotives	13,500 "
89	Miscellaneous machines and equipment	

\* One vessel to be delivered in the first quarter of 1985.

\*\* Possibility open for an increase.

\*\*\* Quantities to be determined by contract.

## List 2 (continued)

No	Commodity Designation	Quantity or Value
90	Wire and cable	60,000 thousands of dollars
91	Alumina	600 thousands of tons
92	Bauxite	240 "
93	Silicon metal	10 "
94	Industrial chain	1.2 "
95	Drive chain	600 thousands of meters
96	Drive chain for agricultural machines	60 "
97	Cast iron fittings for PVC pipe	820 thousands of dollars
98	Pipe for petroleum pipelines and gas pipelines	30 thousands of tons
99	Woven steel mesh	500 thousands of m <sup>3</sup>
100	Exchange of assortments in ferrous metallurgy	130,000 thousands of dollars
101	Zinc	35 thousands of tons
102	Lead	55 "
103	Rolled copper and brass products	7 "
104	Aluminum foil	1 "
105	Aluminum tubes	1,000 thousands of dollars
106	Paints and varnishes, including:	21 thousands of tons
	Auto enamels	14 "
	Plastizols	4 "
107	Printing inks	700 tons
108	Pigments	3,500 "
109	Maleic anhydride	5 thousands of tons
110	Alkyd-acrylic resin AS-3	14 "
111	Agents used in the textile and leather industry	4,100 thousands of dollars
112	Chemicals for plant pest and disease control	31,000 "
113	PVC film	520 tons
114	Thermostable conveyor belts	40 thousands of meters
115	High-pressure pipe	5,000 thousands of dollars
116	V-shaped belt	10,000 "
117	Rubber cups for milking machines	2,000 "
118	Linoleum	2,500 thousands of m <sup>2</sup>
119	PVC pipe and fittings	8,500 thousands of dollars
120	Aluminum fabrications	4,300 "
121	Sanitary equipment for construction	1,000 "
122	Decorative plastics	1,300 "
123	Oak and beech lumber	25 thousands of m <sup>3</sup>
124	Veneer	10 thousands of m <sup>2</sup>
125	Cigarette paper	1 thousands of tons
126	Cardboard containers	1,400 thousands of dollars
127	Seed and nursery stock	36,500 "
128	Miscellaneous agricultural products (deliveries under the contract with PKB and DTD)	4,000 "
129	Corn	300 thousands of tons

## List 2 (continued)

<u>No</u>	<u>Commodity Designation</u>	<u>Quantity or Value</u>
130	Tobacco	5 thousands of tons
131	Cigarettes	1,000 millions of units
132	Meat	40 thousands of tons
133	Canned meat products	16 "
134	Sausages and dried meats	1 "
135	Pasta	10 "
136	Dried mash potatoes	1 "
137	Prunes	12 "
138	Baby food	10,000 thousands of dollars
139	Concentrates and spices	4,000 "
140	Wine	400 "
141	Sugar	50 thousands of tons
142	Goods for the "Beograd" Restaurant	1,000 thousands of dollars
143	Cotton fabrics	8,500 thousands of meters
144	Cotton-synthetic blend fabrics	2,900 "
145	Upholstery and decorative fabrics	500 "
146	Ready-to-wear clothing made up from fabrics	52,000 thousands of dollars
147	Knitwear (with at least 75% wool)	77,000 "
148	Leather and artificial-leather accessories	800 "
149	Leather gloves	200 thousands of pairs
150	Leather footwear	13,000 "
151	PVC footwear and rubber footwear	3,000 "
152	Women's clothing accessories	2,000 thousands of dollars
153	Furniture (including deliveries based on cooperative arrangements)	25,000 "
154	Drugs	70,000 "
155	Veterinary preparations	1,500 "
156	Cosmetics	1,000 "
157	Household chemical products	1,000 "
158	Sporting goods and equipment	700 "
159	Electric ranges	40 thousands of units
160	Spare parts for ranges	500 thousands of dollars
161	Fittings for public illumination	550 "
162	Fittings for household illumination	1,400 "
163	Hotplates	30 thousands of units
164	Goods for specialized stores	64,000 thousands of dollars
165	Printing services	5,500 "
166	Printing of film advertisements	1,500 "
167	Printed products, philatelic articles and phonograph records	900 "
168	Films	250 "
169	Construction of projects in the USSR*	

\* Quantities to be determined by contract.

7045

CSO: 2800/35

## GERMAN DEMOCRATIC REPUBLIC

### DEVELOPMENT, PRACTICES OF PLANNED ECONOMY DISCUSSED

East Berlin EINHEIT in German Vol 40 No 11, Nov 85 (signed to press 14 Oct 85)  
oo 969-976

[Article by Prof Dr Otto Reinhold, member of the SED Central Committee, rector of the SED Central Committee's Academy for Social Sciences: "Socialist Planned Economy—Basis for the Policy of the Principal Task"]

[Text] At the 10th SED Central Committee session, Comrade Erich Honecker explained in detail that solving the principal task would continue to predominate our work over the long haul, and that our party would cross the threshold to the year 2000 with this policy. With its united economic and social policies it derives from the nature of socialism itself and conforms to its social and humanistic character. By this policy it is best ensured that man with his work, his abilities, his interests and his needs always remains in the center of all events. The unity of economic and social policy principally releases those impulses that are necessary for successfully shaping the developed socialist society. It is the foundation for social and political stability and, hence, for the firm link between party and people.

This policy, initiated by the Eighth SED Congress, has been implemented purposefully and consistently for nearly one and a half decades despite all changes since then. The party has always raised and answered the question about the new conditions that have to be created in order smoothly to carry on this policy. As is well known, especially since the late 1970's new inferences had to be drawn time and time again. This concerned the energy policy as much as responding to imperialist economic warfare against socialism, the speed and results of economic intensification as much as the connecting of science with production: For solving two strategic tasks simultaneously--the full use of all advantages and impulses of the socialist society for men's benefit and creating the external conditions needed for it by the safeguarding of peace--socialism needs a high and steady rate of economic growth. The ability to act flexibly is a condition for that continuity.

#### Firm Foundations

Now we must create the premises for being able to carry out successfully, as we have, the policy of the principal task also in the second half of the 1980's and beyond. The coming period undoubtedly holds new challenges ready for us.

Being prepared for it thus is a key issue to future policy. As the balance sheet on our country's social development shows, we have created the crucial foundations for it. That includes the dynamic and steady development of our economy, the development and spread of modern science and technology and our educational potential, the social relations, the commitment to scientific-technical progress, the democratic participation by the working people and many other factors. In particular, it counts that in the GDR a socialist planned economic system was created which, essentially, conforms to the requirements of the intensively expanded reproduction under the conditions of the scientific-technical revolution of today. So Comrade Erich Honecker was able to state at the 10th Central Committee session: "So we have every good reason to speak of a developed system proven in practice on which we may rely with certainty in all our further work."<sup>\*</sup>

The practical results of this socialist planned economic system, qualitatively improved in recent years, are obvious to everybody.

First, with its help we managed to hasten the economic rate of growth and secure dynamism and continuity. Whereas in 1982 the national income grew by 2.6 percent, in 1983 it already came to 4.6 and in 1984 even to 5.5 percent. In the first 9 months of this year we again got a growth of 4.4 percent. Clearer still this dynamic growth in our economic development becomes when we are considering not only the percentage growth, but its absolute magnitude. Whereas from 1977 to 1980 the national income grew by M 29 billion, between 1981 and 1984 that figure came to 35, for 1984 alone even to 11.7 billion. The growth rate was accelerated in industry, agriculture and other economic areas. The development was especially rapid in those sectors that are playing a key role in our intensively expanded reproduction and in the use made of the scientific-technical revolution.

That did what needed doing to carry on resolutely the unity of economic and social policy. Despite all the aggravation in the international situation, not a single sociopolitical goal or program had to be deleted or curtailed. New measures were set down, initiated and implemented that further extended our social security and safety. The further acceleration of housing construction, the core of the SED's sociopolitical program, and the ensuring of job security must here be mentioned as much as the steady increases in the working people's real income and the stable consumer prices for basic necessities and for rentals, tariffs, and services. The contrast with the reality of capitalism becomes especially obvious in this sector. Not only could the GDR achieve dynamic economic growth--it also translates that steadily into social progress.

Second, by means of the modern functioning system of the socialist planned economy we managed to tap what are in principle new sources of growth. Growth now relies almost exclusively on increases in productivity and labor efficiency. While since the early 1980's the average annual national income grew between 4 and 5 percent, the specific consumption of raw materials, energy and material

---

<sup>\*</sup>"Zur Vorbereitung des XI. Parteitag der SED, Aus der Rede des Genossen Erich Honecker, 10. Tagung des ZK der SED" [In Preparation for the 11th SED Congress--From Comrade Erich Honecker's Speech--10th SED Central Committee Session], Dietz publishing house, Berlin, 1985, p 26.



dropped by 6.2 percent annually. The trimming of production consumption became a crucial growth source. Whereas between 1977 and 1980 but 2.8 percent of the national income growth was fed from that source, from 1981 to 1984 more than 40 percent came out of the reduction in specific production consumption.

These facts indicate that the planning system has ever better effects on the qualitative processes, on intensification, and on making economically efficient use of modern science and technology. A key issue for further economic development geared to growth is to make the trimming of production consumption and other forms of expenditures permanent and to reproduce these growth sources over and over again, as was reiterated by the Central Committee at its 10th session.

Third, the linkage between science and production and between scientific-technical development and other sectors in public life was raised onto a higher level. That includes the entwining of science and research potentials in the combines with the economic cycles of these economic units, and the long-term close connection of the potentials in the Academy of Sciences, the universities and colleges with those of the combines, cooperatives and other economic institutions. Significant new impulses and initiatives from the working people were released for implementing the SED's economic strategy.

All that illuminates that essential premises were set for coping with the challenges, and thus for the smooth continuation of the policy of the principal task during the next historic phase.

#### The Planned Economy with High Dynamics

At the 10th Central Committee session, Comrade Erich Honecker referred to a party program remark that is exceptionally important to our social policy, to that "the further shaping of the developed socialist society is a historic process of penetrating political, economic, social and intellectual-cultural changes."<sup>\*</sup>

Thus the SED assumes, in theory and practice, that shaping the developed socialist society is an extremely dynamic process that embraces all sectors of public life, including also the management, planning and economic cost accounting system. The idea behind constantly perfecting it is to further this dynamic process consciously and systematically, on behalf and for the benefit of all society as well as each of its member. The key issue for it always is to connect a rapid and economically efficient development and application of modern science and technology inseparably with social progress in its many different forms.

The scientific-technical revolution of today causes a fundamental change in the productive forces. Microelectronics, robots, information technology, automation, computers, new working materials, biotechnology and many other things have long entered the economy and many other domains of life. The

---

<sup>\*</sup>Ibid., p 11.

application of modern automated production systems controls that as much as does the use of modern technical equipment in medicine or in households.

The characteristic feature of such technical change evidently is that there is hardly a sector in the economy or in public life that would not be fundamentally changed by such key technologies as microelectronics or data processing. In industry as much as in agriculture, in commerce and transport and in other sectors a fundamental and general transformation thus is taking place in techniques and technologies and a further development of the character of labor and of many social relations. The rate of this transformation has vastly accelerated since the late 1970's and keeps accelerating further.

The use of key technologies in many sectors permits an increase in labor productivity and economic efficiency by leaps and bounds. Automated project planning, automated production preparation and control, and flexible automated production systems raise labor productivity two and threefold and even by multiples. Automated storage can reduce costs in that area between 40 and 60 percent.

Attaining such a significant economic benefit while implementing a great social effect mainly depends on that in any given sector, in the various economic branches, in the combine as in the enterprise the most effective conception and production and labor organization are found for applying the key technologies. Microelectronics and data processing simply cannot be used the same way, say, in the chemical industry, in machine building or in agriculture. One of the most important conditions for their economically efficient use is to integrate them organically in accordance with the specifics of any given reproduction process and find the best ways and means for each and every labor sector. Also the speed of technical change differs from sector to sector. This matter of practical application evidently is one of the key issues of scientific-technical change, of the organic linkage between the scientific-technical revolution and the advantages of socialism.

That already indicates that finding the best and economically as socially most effective ways for the practical application of the key technologies is not confined to the creative efforts of scientists and engineers, but is the task and business of all working people.

That the combines and enterprises bear a special responsibility here, is only natural. The innovator movement and cooperative efforts between the engineers and workers obtain a new place value. The in-house production of means of rationalization is an important connecting link in the modernization processes. Workers are wanted who act in awareness of their responsibility and have high skills, comprehensive technological knowledge and experiences and, not last, the necessary measure of imagination. Social ramifications and the requisite social prerequisites are penetrating and all-inclusive.

To achieve dynamic economic growth at reduced costs over the long run, and thereby to create a fundamental condition for successfully shaping the developed socialist society, requires a comprehensive transition to intensively expanded reproduction. Therefore the SED's economic strategy directs us at using all prerequisites that exist in our society for resolutely enforcing



this, in principle, new type of social reproduction. Necessarily linked with it and always aimed at the implementation of the social goals of socialist society, a process of perfecting the production relations was initiated, crystallized above all in management, planning and economic cost accounting measures, which lends effective stimuli to our society's successfully addressing itself to intensively expanded reproduction.

To promote the penetrating scientific-technical change and develop the social character of our society at greater depth, our party implements a number of fundamental requirements at an ever higher level through lending a concrete structure to the socialist planned economy:

First, what matters is that the SED's social and sociopolitical goals, the policy of the principal task, the unity of economic and social policy, can steadily be implemented, and this under the altered conditions. Steadily obtaining that goal is the crucial criterion for the socialist planning system--now as well as in the future historic developmental phase. A dynamic, steady qualitative and quantitative growth by way of intensively expanded reproduction is the basic condition for it. Management and planning must make sure that with the capacities and potentials available to us maximum economic and social results are achieved.

Second, an essential criterion of the planning system is that it stimulates a rapid development and an economically and socially effective application of modern science and technology and efficiently connects science with production. With its help we are intent on creating the kind of conditions where not only some innovation or another is introduced, but where the fundamental technological change is brought about under conditions adequate to socialism. Coping with the fundamental technological change is the key issue for not only sustaining the GDR as one of the leading industrial states in the world, but for its being able to maintain and expand its positions in international economic affairs. Within the scope of the shaping of developed socialism, this never concerns merely technical or technological changes, at that. They, rather, are inseparable from the practical enforcement of the social and humanistic character of our society. Solving this task is not only the decisive goal of scientific-technical progress in our country, it also determines its ways, forms and conditions. Socialist rationalization without improving the working and living conditions does not deserve to be called "socialist." That includes social security as much as giving a socialist structure to the character of labor and of the jobs and of the relations among the working people.

Third, the planning system focuses on maximum flexibility. In the industrially developed countries of capitalism and socialism a high and constantly growing innovation rate has come to prevail for products, technologies and production procedures. Today there are production areas where the production technology changes fundamentally every 2 to 4 years. Our party assumes that 30 to 40 percent of commodities have to be upgraded each year, to keep in step with international development. To the extent that the transition to intensively expanded reproduction is put into practice in the CEMA countries, the speed and scope of upgrading are bound to increase further.

Reacting fast and flexibly to the rapidly changing conditions on the internal (the socialist) and the external (the capitalist) markets thus becomes a key issue for intensively expanded reproduction today and still more so in the historically foreseeable future.

Fourth, a basic feature of our planning system is its stimulating effect on the impulses of socialist society for coping with the tasks here described. The unity of economic and social policy is an essential basis for it. And this involves the various forms of material inducements, the performance rating, as much as the spread of socialist democracy, especially in the economic field. The field for democratic participation in management and planning and for enforcing the SED's economic and social policy in practice is broadening more all the time. For one thing, apart from the plan draft debate and the various forms of mass controls, all working people's participation in the planning and practical structuring of technological change, especially in socialist rationalization, is gaining importance constantly. The right and practical opportunity to take part in the management and planning of these fundamental processes is an essential element of real socialist democracy. The certainty thereby to be able to secure one's own interests, the interests of the working people, is--as the comparison with capitalism demonstrates today--one of the greatest advantages, an important democratic accomplishment, of socialism.

And then also, democratic participation in developing the territory is gaining increasing importance. Many laws serve that purpose, for instance the widely discussed law on the activity of the local state organs.

In further shaping socialist democracy we keep in mind that the educational level of the vast majority of the working people has risen significantly. Some 85 percent of all working people now completed vocational training. Most of them went to a 10-grade polytechnical secondary school. Some 21 percent graduated from a university or technical school.

This high educational level creates new and greater opportunities for the working people's democratic participation; it requires at the same time that we find the kind of forms of democratic participation that are compatible with such an educational level.

Fifth, finally the further development of the management, planning and economic stimulation system brings it about that the socialist economic integration with the Soviet Union and the other countries in the socialist community is fostered at an optimum. The GDR is among those industrially developed countries that gets a large share of its national income--circa 40 percent--through foreign trade. Two thirds of that again, in turn, are transacted with the countries in the socialist community.

#### Unity of Democracy and Centralism

Since the late 1970's, great attention has been paid to a constructive solution for these tasks, and far-reaching changes were made. A key issue there was the forming of the combines and the steady improvement of their efficiency.

What is essential about these combines is the link between science and production and their being combined under one management, the assigning of full responsibility to the combines--from R&D all the way to sales. Along with it, many changes were made in management and planning. While formerly in the performance rating for a combine or enterprise industrial commodity output came first, and many a production increase thereby was paid for too dearly through excessive material consumption and sometimes also through puffed up cooperation, now one focuses, through the parameters of net production and net profit, for public requirements and goods intended for export, on labor efficiency. Important advances have been made in the application of the performance principle.

Management, planning and economic cost accounting in agriculture have been perfected. The farm price reform has further increased the interest in production yields. At its 10th session, the Central Committee issued important resolutions on the cooperation of the Academy of Sciences, the universities and the colleges with the combines relative to basic research. Much else could be referred to in this context which would in toto justify the remark that in the GDR in recent years the management, planning and economic cost accounting system has been so much improved that it essentially conforms to the requirements of intensively expanded reproduction under the conditions in our country. This was one of the reasons why despite great international and internal changes high and steady economic growth could and can be ensured.

To say so is important, inter alia, because bourgeois ideologues, remote from all reality, stereotypically reiterate the contention that the socialist planned economy, relying on democratic centralism, presumably cannot cope with the problems of the scientific-technical revolution and organize a production that meets public demands. Frenetically they are seeking to interpret measures for perfecting management and planning and for flexibly reacting to market requirements as if that were to introduce elements of a capitalist-oriented market economy into socialism. Yet no one, mind you, can seriously assume that we, after having successfully completed the transition from capitalism to socialism and in possession of a functioning and proven socialist planned economic system, would let capitalist conditions and methods back in, by the backdoor as it were, when they are the ones to have proven unsuitable for establishing high rationality at the overall economic and social scale in unity with humanity while consistently transforming scientific-technical progress into social progress. What we want is to fashion the socialist economy and its management system in such a way that the requirements for today and tomorrow are met for the benefit of the people. To us the perfecting of the socialist planned economy means developing both sides of democratic centralism. That is among the prime advantages of socialism.

Democratic centralism always combines two essential elements--central social management and the active participation of all members of society in this management of the economy and the society. And there one must always determine and ensure in practice an optimum ratio between the type and extent of central management decisions and the economic units' responsibility of their own. The dynamics of the economy and the society inevitably brings it about that this ratio also is subject to the dynamics. So you do not have to be a specialist

to be able to realize that this ratio must under the conditions of the scientific-technical revolution of today and of the intensively expanded reproduction be different from what it used to be within the scope of a, primarily, extensively expanded economy. The current requirements were taken account of above all by forming and further developing the combines, which have become the basic type of social organization in socialist large-scale production and bear a high economic responsibility for all the phases of the reproduction process united within them--from R&D to sales, including export.

No one is likely to deny that with this rapid change in technology and economic structure and the high rate of product substitution the market becomes more important. The close interactions between production and circulation and the high flexibility in these relations are a decisive link to comprehensive intensively expanded reproduction. Our party pays great attention to keeping these interrelations effective and will continue to do so. This does in no way mean, however, that we would abandon democratic centralism--which proved the cornerstone for our successful advances--or weaken it in any way, that we are torn to and fro "between Marx and the market," as bourgeois ideologues allege.

Anyone who has a sense for realities will not be able to deny that the democratic element of the active participation by the members of society in the management of the economy and society becomes ever more clearly pronounced in ordinary life. That holds true equally for the central management of the economy and society. It has reached a higher level in various respects. Here we shall refer only to a few aspects which bear that out. The policy of the principal tasks, the unity of economic and social policy, and the inseparable connection between scientific-technical and economic progress are not even conceivable without central social management. Only imagine for a moment that the housing construction combines and the communal apartment offices were to work along capitalist market principles. A housing construction program and a housing policy as undertaken by the SED would be completely impossible under such conditions. The same is true of the other domains of the party's social policy. Most trade union representatives in the FRG no longer doubt that there can be no full employment either today or in the future if that task is to be resolved by specific corporations on the basis of the profit economy. Only within the framework of society, only on the basis that one can dispose, overall socially, over all social resources for the benefit of the people, can such problems be coped with. Central state management in the GDR ensures the kind of economic development that by means of it the social, humanistic character of socialist society is made to prevail with everyone perceiving it.

Technological change and the structural economic changes connected with it make high demands on state management, of course. Determining the chief research trends, rapidly introducing key technologies, and structural economic changes call for central decisions. But they are effective only if they come together with the combines and other economic units showing a high degree of responsibility of their own.



If within this framework a high place value is attributed to the role of circulation, commodity relations and their laws--particularly the value law--it has nothing, absolutely nothing, to do with capitalist economic methods. Commodity production, commodity relations and capitalism are not one and the same, after all. Commodity relations existed many centuries prior to capitalism. And they are likely to exist long after capitalism is gone. As history shows, the character of commodity production always depends on the character of the economy and society within which it develops. In our society that is a firmly integrated element of the socialist order. Its place and its effect are determined by the essence, the targets and the social organizations of the socialist order. In other words, it is and remains part of the socialist planned economy; it forms no opposition to it.

The formation of a system of socialist planned economy that essentially conforms to the requirements of the scientific-technical revolution and of intensively expanded reproduction is a crucial outcome of the SED's creative activity after the 10th party congress. Above all it demonstrates its ability concretely to apply modern science, to react fast and flexibly to new challenges and to draw the necessary conclusions.

5885

CSO: 2300/74

SCIENTIFIC PROGRESS, STRUCTURAL ECONOMIC CHANGE LINKED

East Berlin EINHEIT in German Vol 40 No 11, Nov 85 (signed to press 14 Oct 85)  
pp 977-985

[Article by Prof Dr Helmut Koziolk, member of the SED Central Committee, director of the SED Central Committee's Institute for Socialist Economic Management: "Organic Link Between the Scientific-Technical Revolution and the Advantages of Socialism"]

[Text] The organic link between the scientific-technical revolution and the advantages of socialism--as explained in the party program of the 10th party congress--ever more clearly emerges as a key question for the implementation of our economic and social strategy in the 1980's. This is the decisive way for tapping qualitatively new possibilities for the growth of labor productivity and efficiency and successfully coping with the challenges in this decade. We have made good headway. Yet it is being demanded by "the phase of intensification our country now enters to use the advantages of socialism more still for coping with the scientific-technical revolution."<sup>1</sup> Our country's future as a modern industrial country with a developed agriculture and strong positions on the international markets depends on our increasingly succeeding in achieving and making economically effective high scientific-technical results and applying as resolutely as possible the potentials of the scientific-technical revolution to productive forces development.

Objective Link Between Socialism and the Scientific-Technical Revolution

The fundamental prerequisite for ever more comprehensively realizing the meaning of socialism, of doing everything for the good of the people, primarily lies in raising our economic performance growth at a maximum through an increasingly closer connection between the scientific-technical revolution and the advantages of our social order. Since the eighth party congress, for nearly one and a half decades, we have been pursuing the course of the principal task with its united economic and social policies, which wholly conforms to that goal. And with this policy, aimed at peace and at the good of the people, we shall also cross the threshold to the year 2000.

The prime prerequisite for solving all the tasks posing themselves during the continued shaping of the developed socialist society is that the productivity and efficiency potentials resulting from the organic link between the scientific-technical revolution and the advantages of socialism will make still

much more of a difference. The chances for gradually raising the citizens' material and cultural standard of living and for the extent to which the people's needs can be satisfied depend on it. Still in the computer-aided age, as Comrade Erich Honecker emphasized only recently--man with his needs remains in the center of all events.<sup>2</sup>

For need satisfaction our party is concerned with all sides of human life, from purposefully improving housing conditions via the greater demands for consumer goods--made possible by the rise in income--when mainly high-grade and greatly attractive technical commodities are gaining an ever higher place value, all the way to men's demands made on the cultural level, fine education and social comfort. Already in the Critique of the Gotha Program, Marx made the point that precisely that part of the GNP increases that is needed for the satisfaction of collective needs, such as education and health, and this "to the same extent that society develops."<sup>3</sup> This growing need satisfaction in the broad sense is inseparable from the development of the socialist way of life.

Achieving high productivity and efficiency through the results of the scientific-technical revolution also is necessary to be able to continue in extending and expanding the material-technical base by way of modernization and ensure the reproduction of the natural environment. Precisely under that aspect, the Central Committee at its 10th session focused on applying key technologies like microelectronics, modern computer technology, automated design and production preparation, flexible processing systems, new manufacturing technologies and biotechnology and creating closed material cycles. Primarily in the combines these processes are taking place, accelerating technological progress and the organic linkage between science and production. They are the economic units which, under the conditions of the scientific-technical revolution, out of their own capacity implement the intensively expanded reproduction cycle and contain within themselves under unified responsibility all decisive phases and components of the reproduction process. With them "our party has used at the right moment the great opportunities for systematically organizing the socialization of labor in placing all the management activity in industry, the building trade, transport and communications on what is in principle a new foundation."<sup>4</sup> This fully conforms with the insights of the classic authors of Marxism-Leninism. Lenin, e.g., compellingly proved that and how under socialist production relations science and technology must be used for economic construction; and that it was the job of the working class to link "the last word in science and technology with the massive unification of consciously working people who give birth to socialist large-scale production."<sup>5</sup>

In using the results of the scientific-technical revolution two effective trends at least are involved. For one thing, this creates the prerequisites for vastly improving the capability of the material-technical base itself. More productive machinery and installations, methods that economize in energy and material, new commodities produced faster, with higher use value and at lower cost, more flexible reaction to users' demands--all these are results of the high scientific-technical and economic level of our material-technical base. Then also, however, the use of modern key technologies is crucial for simultaneously also constantly improving the working people's working conditions, gradually eliminating heavy physical and psychologically stressful activities and organizing jobs in accordance with the socialist character of



labor. So all deliberations regarding a greater use of industrial robots, the pushing for modern technologies all the way to setting up CAD/CAM jobs, and the mechanization of auxiliary processes must aim of course at higher labor productivity, but at creating more humanly dignified jobs at the same time. Especially the application of the modern key technologies offers the chance that man more and more--as foreseen already by Marx and Engels--becomes the creative molder and controller of the socialist production process. Then more time becomes available for other activities, in material production, in the non-producing sectors, for education, for the family, "to expand, enrich, advance the workers' process of life," as the Communist Manifesto puts it.<sup>6</sup> All this is of an importance of principle to turn the work in the process of the further shaping of the developed socialist society more and more into a vital need, yet it deserves all the more attention since the demands made on the capabilities and performance dedication of the working people increase especially in these new processes and everything has to be done to produce the most favorable conditions for it. That profoundly agrees with our policy of doing everything with the people and for the people.

#### Productive Forces Development and Personality Development Reciprocally Conditioned

Successfully coping with the challenges of the scientific-technical revolution in socialism is greatly dependent on that fundamental changes are taking place in the character of labor which constantly release new impulses for creative initiatives. Human labor--the condition for the existence of society as of the individual in socialism as well, of course--gains increasing value in the process of life of man in socialist society in that it--freed from exploitation and from the scourge of unemployment--more and more shapes its personality-promoting character. Productive forces development and personality development thus are reciprocally conditioned in socialism. Through the scientific-technical revolution not only new opportunities are created for easing labor and enriching its creative content, but the demands also are growing that are made on men's subjective capacities, knowledge, abilities and facilities.

The party's educational policy created far-reaching prerequisites for granting all citizens a fine general education, solid vocational training and constant continuing education. Whereas in 1945 in the territory of today's GDR only 24 percent of all working people had complete vocational training, only 3 percent of them having graduated from a technical school or university, today the figure is 85 percent, with 21 percent having graduated from a technical school or university. In the young generation it is even as much as 95 percent with completed training. The educational differences between man and woman, stemming from the capitalist past, were done away with. Some 78.9 percent of all working women got complete vocational training; more than 36 percent of the university cadres, more than 60 percent of all technical school cadres and 50 percent of all technicians are women. Constant continuing education has become massive, a characteristic of the socialist way of life. Right now, more than 1.7 million working people are already engaged in the various forms of adult education.

This impressively reflects the ability of socialist society to link, in accordance with planning, the instituting of basic humanistic values with the tapping of economic-productive performance potentials, the requirements of the present with those of the future. This intellectual potential, generated by the streamlined socialist educational system, is among the crucial impulses and advantages of socialism, yet with still greater consistency must one approach its economic efficacy in enforcing the scientific-technical revolution.

Skilled labor and the working people's dedication and creativeness--inexhaustible sources of growth--make up our country's most precious potential. Tapping this knowledge and performance potential--the "principal accumulation of wealth"<sup>7</sup>--is the prime business of socialist management activity since, after all, ultimately "men's training and the level of management activity decide the success with which one manages to transform up-to-date technology into top economics."<sup>8</sup> Introducing the key technologies calls for fully exploiting the creative potential of all cadres, comprehensively organizing the cooperative efforts of production workers, designers, technologists and ADP specialists, and ensuring the educational lead, the needed basic qualification for operating the highly productive installations with assurance. How important this potential is becomes apparent by the fact that in the GDR economy over 200,000 associates work in R&D and more than 4 percent of the national income is spent each year on science and technology.

Coping with the scientific-technical revolution mainly also goes along with qualitatively strengthening the scientific-technical potential and the perfecting of its structure in the combines. Each combine, hence, will have to train its own potential in microelectronics, CAD/CAM, and software specialists, in designers and technologists.

Due to the tremendous development of these modern productive forces, entirely new demands are made on the skill of the working people, their work regimen, their flexibility and their cooperation. The substance and requirements of the work shift more and more into the intellectual-psychological area. More and more man is relieved of routine operations and one-sided activities. Of course, that is a lengthy process which in part is even contradictory. But it got started with success and involves an increasing number of working people. It comes down to the certainty, confirmed by the daily experience of millions of working people, that thereby jobs and work assignments are not only secured but even made more effective, demanding and substantial, from which constantly new social impulses arise for speeding up the scientific-technical progress. This demand must always and everywhere be met fully through the confident work done with the people.

#### **Emergence of a Modern Material-Technical Base**

The proof is there for that we can in our country connect the accomplishments of the scientific-technical revolution with the advantages of socialism and derive economic effects from it. The increase of the produced national income from M 117.4 billion in 1970 to M 222 billion in 1984, the significant growth in labor productivity in the industrial ministries' sector, based on net output from 1980 to 1984 by an average 6.2 percent annually, the increasing drop, so essential for national income growth, in the specific

consumption of economically vital energy sources, raw materials and semi-fabricates--by an annual 6.2 percent from 1981 to 1984--and the annual cost reduction in industry by an average 1.9 percent from 1981 to 1984--all these results attest to that economic progress.<sup>9</sup>

This development occurred on the basis of an enormous quantitative and qualitative development of the material-technical base. The necessary and completely new construction of a ferrous metal industry, heavy machine building, farm machinery construction and ship building in the 1950's and 1960's was followed in the 1970's by the further development of the material-technical base by branches like computer technology, microelectronics, the construction of science devices, and automation techniques. In implementing the new phase of the economic strategy by way of intensification, now the even internationally tremendously developing key technologies control the basic trends for the productive forces development in the economy.

A cardinal question for our economic growth that touches on all sectors and branches and on live and embodied labor is that of higher refining, expressed in higher use values and value growth. That is why enhanced refining was initiated all through the entire economy. An essential trend lies in making much more economic use of domestic lignite as energy source and raw material. Procedures for carburization, low-temperature carbonization, fuel dust production, and the introduction of a combustion technique for ballast-rich raw lignite in electrical energy production are among international top achievements.

In the development of refined chemistry the emphasis is placed on further developing the carbochemical procedures and on a higher utilization rate for petroleum. By putting into operation new capacities for a deeper petroleum fractioning in Schwedt and Leuna, the proportion of light products is going to be raised to 75 percent by 1990. That marks a decisive step toward producing fuels and chemical commodities with a very low specific petroleum consumption even by international standards.

The introduction of the plasma smelting of alloyed scrap steel, the construction of the converter steel plant in the VEB Hermann Matern strip mill combine Eisenhuettenstadt and the development of electro-metallurgical and vacuum-metallurgical capacities were the decisive stages in the development of refined metallurgy. The converter steel plant put into operation in 1984, with a capacity of 2.2 million tons of raw steel per annum embraces one third of our country's total raw steel capacity. This procedure accomplishes a drop in material consumption by 13 percent, and in energy consumption by 28 percent, and achieves a labor productivity boost of 700 percent. The proportion of refined assortments in the ferrous and nonferrous metallurgy together was raised meanwhile to over 70 percent and will go up to circa 90 percent in 1990.

Through the development of new working principles and important advances in technology development, glass and ceramic materials also find new applications. This trend becomes especially important because domestic raw materials are widely used in it.

An efficient infrastructure is imperative too for comprehensive intensification. Increasing weight attaches to the production and rational use of energy and water management and information services. The number of telephones rose from 2 million in 1970 to over 3.5 million in 1984. A stretch of roughly 1,000 kilometers of railroad tracks was electrified between 1971 and 1984. The industrial power plants' installed output had risen by 1984 to four and one-half times that of 1950. The maximal daily capacities of drinking and utility water supplied by utilities rose from 5.1 million m<sup>3</sup> in 1970 to 7.7 million in 1984.

#### Further Structural Change through Scientific-Technical Progress

Proceeding from the objective developmental trends of the productive forces, our party worked out well ahead of time the qualitative requirements stemming from the strategic developmental trends for all public areas.

The resolutions of the ninth and 10th sessions of the Central Committee initiated measures that will continue to cause a significant structural change in all economic branches. This structural change is proceeding in two closely connected ways.

First we have there the modernization of what we have got closely connected with innovations. For the further performance growth it is very important that of the equipment used in the industrial ministries' sector in 1983, valued at M 226 billion, more than one-third was 5 years old at the most and a total of 60 percent, 10 years. Its proportion of automation since 1980 rose from 47 to 51 percent. Over 20 percent of the equipment has flexible automated controls today. This kind of transition to intensification was imperative for ensuring further economic growth, without which there is no social progress. Every type of human activity wanted in this process of constant modernization and rationalization, if "properly" undertaken, is worthwhile to society.

Secondly, connected with the traditional branches, new industrial branches are generated, marked by a new production structure and new products and technologies. With them there also come new demands for the education system, production organization, cooperation and other sectors. From microelectronics, as from high-tech all-around, new impulses emerge affecting all branches and fundamentally changing the economy. In machine building, e.g., the combination of machines, robots and computers leads to the computer-integrated and flexible automated factory. Computer-based design and technology by means of CAD/CAM systems in an increasing number of areas are becoming elemental prerequisites for modern production and a chief approach to its intensification. The target for this development--where CAD/CAM systems are used as production tools for intellectual work--are automated or labor-saving integrated production systems for a broad spectrum of manufacturing processes from small series to mass production. We are after a continuous automation of the whole reproduction process from the drawing board and design to technological preliminaries via material procurement, prefab, assembly and quality control all the way to shipping. The crucial trait in the changing of the material-technical base of the economy for the period to come, along with refining, and closely linked with it, will be the broad development and application of



automation techniques. That is more and more becoming the main high-tech application trend. Entire technological processes, fabrication sectors and enterprises will be converted on that basis. And automation will capture all areas of human activity, the material and mental processes. The important development and use of industrial robots must be viewed in this context. In late 1984, circa 43,000 industrial robots were in operation. Another 13,500 are supposed to be produced and used in 1985, according to the 1985 national economic plan. That applies a vast potential to the needed productivity boost.

#### Close Link of Science with Production--The Core of Comprehensive Intensification

Enforcing the scientific-technical revolution in socialism is linked to the comprehensive intensification of the economy, which places economic growth on an entirely new foundation. Thereby we are pursuing the path of the intensive expansion of reproduction that saves resources in every way, the path on which the expenditure of live and embodied labor drops while the output becomes larger and better in quality. Comprehensive intensification is marked above all by a speed-up of production upgrading based on new products and modern technologies meeting the highest international standards. It embraces all sectors of production and public life, all the phases of reproduction, and leads to an acceleration and an effective operating of the reproduction cycle, an increasing role given over to time economy.

In the first half of the 1980's we managed successful steps on this road in ensuring growth fully by exploiting our own domestic reserves--particularly by trimming specific energy and material consumption, using more domestic raw materials and modernizing the capital assets on hand.<sup>10</sup>

Placing further economic growth permanently on the foundation of comprehensive intensification calls for a new and higher manner of linking the scientific-technical revolution with the advantages of socialism. It is necessary, in particular, to use abundantly those key technologies that determine the direction and rate of scientific-technical progress and achieve top positions in decisive fields. The high level of the long-term scientific-technical and economic cooperation agreed on with the Soviet Union and the increasingly closer cooperation with the other socialist countries benefit this process and help all countries in making faster headway.

So that science and technology stand up to the magnitude of the tasks to be coped with, the Central Committee, in getting set for the 11th party congress of the SED, has drawn up far-reaching inferences. Doing so it assumes that the criteria for the speed in which new scientific-technical data are gained and are broadly used economically are set by the international standards, by productive forces development, which is in itself speeding up internationally. These incorruptible yardsticks compellingly demand significantly raising in each combine the proportion of such economically useable scientific-technical top achievements that crystallize in novel products and novel technologies, improve the cost/benefit ratio in production, and help improve meeting public demands.



Through the combines and their growing capabilities, fundamental conditions are at hand for permanently ensuring the high dynamics in economic development through comprehensive intensification and hastening the rate of development in a target-directed manner. The core problem here lies in economically linking science more closely with production, from branch-specific basic research via design, technology, production all the way to the selling of the commodities.

An exceedingly important prerequisite for this is that the combines' important science and research potentials are most closely linked in cooperating on an economic basis with the facilities of the Academy, the universities, and the colleges and technical schools. Such cooperation can vastly help in upgrading production at significant dimensions, as one can see internationally that pioneering innovations have been suggested, especially, by basic research data.

Also by organizing territorial research cooperation can considerable performance reserves be tapped. Especially in our country there are the most favorable preconditions for enforcing on the territorial level--through coordination with the branches and institutions concerned--a streamlined production line, the procurement and use of modern specialized devices and equipment for research, and organizing interdisciplinary cooperative efforts among the various partners.

Primarily from the key technologies it is that important economic effects emanate. They help boost labor productivity, trim production consumption, enhance product quality and production continuity, and improve the economy of funds. It is thus all the more important to put these modern key technologies into full effect in making as much use as possible of the extant installation base and in improving its capability, principally by modernization. To that end it is of an importance of principle that centralized capacities in rationalization means construction are turned into comprehensive rationalization and automation enterprises and that effective rationalization means construction sectors in combine enterprises are further strengthened or set up. Rationalization means construction must become the centerpiece of the most up-to-date technologies, the chief agent for the planned fixed investments. In this process, already under way, the setting up of capable groups for using microelectronics and the preparation of appropriate users' programs recommend themselves. The formation and implementation of the CAD/CAM technology are gaining increasing importance there.

Especially on this way to comprehensive intensification, which serves the continuing implementation of our party's economic strategy, the means are produced that we need to cope in our country, for the good of the people, with the scientific-technical revolution.

#### Beneficial Effects of the Planned Economy Regulations

Pursuing this path of comprehensive intensification with more rigor still in all domains is emphatically being helped by our functional system of the socialist planned economy, in which democratic centralism is the decisive point. The combines, the basic form of the social organization of socialist large-scale production, are the backbone of this system. The measures decided on

by the party and government for further perfecting management, planning and economic cost accounting, therefore are most closely linked with the development and consolidation of the combines.

To direct the economic interest of the combines and enterprises at high production growth with lower production consumption and lower costs and at their raising their contribution to the real and distributable economic end product, their performance is rated in accordance with the chief parameters of net production, profit, products and services for the population and export. Used in a complex fashion, they express better the results of intensively expanded reproduction than the previously used parameters did and they more accurately document how the combines have met their economic tasks.

By more closely linking planning with economic cost accounting, the conformity between material and financial planning, and the measures introduced for making a more effective use of industrial prices, cost planning itself became more expert. What is achieved through science and technology, or through trimming production consumption and boosting labor productivity, or--as advances in intensification--through production substitution, thus is expressed in increased profits and reduced prime cost per M 100 in commodity output. Measures have been issued in recent years that are designed for a reciprocal penetration between science and production and for accelerating and making more efficient the whole reproduction cycle. That includes measures for economic cost accounting for the science and technology sectors in the combines which--as e.g. the purchase and selling of scientific-technical achievements--foster the interest of R&D collectives in new ideas and faster application, or in other words, in a higher economic efficacy of scientific-technical work.

That includes also measures aimed at a vast speed-up in production upgrading. Concrete stipulations have thus been made on working with tasking workbooks in R&D, preparing economic goals, defending R&D projects and accounting for scientific-technical work.

Important as these rules and regulations are for stimulating high creative achievements and pushing them in the right direction--achieving those ambitious goals calls for a vast mass initiative. Lending again and again new impulses to it through political-ideological indoctrination in the party, trade union and FDJ organizations is a commitment and mission for all communists, for all the chiefs. They bear a high responsibility for shaping combative attitudes toward meeting the party resolutions and exercising overall social interests and doing all that can be done to strengthen the atmosphere of trust in the work collectives.

### Everything with the People

New criteria result for developing and using the labor capacity, especially the intellectual potential. Addressed are all the members of the "social total worker," from the production worker to the noted scientists, from the technician and master foreman to the general director and minister. The work of the innovators, mainly the planned, collectively organized innovator

innovator activity, finds a broad testing ground for an active involvement and all-inclusive cooperative efforts as between the workers class and the intelligentsia and for hastening scientific-technical progress. More than one-third of the workers class takes an active part in it--one out of every four working women and every other adolescent. Yet the energy of youth can be largely more mobilized if responsible tasks are still more consistently assigned to young people. That is demonstrated by the development of the MDM movement, the youth brigades and projects and the youth research collective.

With automation and computerization increasing, the role of live labor and of the subjective factor does not diminish by a long shot. On the contrary. Man, with his abilities, is and remains the chief productive force. With the speed-up in production substitution, the flexible and rapid reaction to changes in market requirements, the expansion of rationalization means construction and consumer goods production and other tasks, modern large-scale production more and more compellingly demands the willingness and ability of many working people to address new tasks and acquire new knowledge. For this needed flexibility of manpower, the rationalization experiences gathered under the "Schwedt Initiative" in cutting back jobs and in the recruiting of and well-timed training for manpower for new, economically more effective activities, are of a national consequence of principle because now it can be demonstrated practically how in our society such basic social values as secure jobs are combined with the economic requirements for higher efficiency so that, in other words, economic and social policies are vividly unified. These are vast, progressive transformations of the labor processes and the production organization, aimed at above-average boosts of labor productivity and the full utilization or improving of manpower qualifications.

That all the interconnected social questions in improving working and living conditions are to be clarified in advance together with the trade unions and the working people get involved in their solution in good time is of an importance of principle for a climate of confidence in our republic in which "for the first time on German soil there is a state in which man is the measure of all things," one which guarantees "liberty, democracy, full employment and social security."<sup>11</sup>

#### FOOTNOTES

1. "Zur Vorbereitung des XI. Parteitages der SED, Aus der Rede des Genossen Erich Honecker, 10. Tagung des ZK der SED" [In Preparation for the 11th SED Congress--From Comrade Erich Honecker's Speech--10th SED Central Committee Session], Dietz publishing house, Berlin, 1985, p 32.
2. Cf. Erich Honecker, "The Building Trade Makes an Outstanding Contribution to Strengthening the GDR and Safeguarding Peace," NEUES DEUTSCHLAND, 15/16 June 1985, p 3.
3. Karl Marx, "Critique of the Gotha Program," "Werke" [Works], Vol 19, Dietz publishing house, Berlin, 1962, p 19.
4. Guenter Mittag, "The Meaning of Our Policy: Everything with Men and for Men," NEUES DEUTSCHLAND, 21/22 September 1985, p 5.

5. V. I. Lenin, "The Great Initiative," "Werke," Vol 29, Dietz publishing house, Berlin, 1961, p 413.
6. Karl Marx/Friedrich Engels, "Communist Manifesto," "Werke," Vol 4, Dietz publishing house, Berlin, 1959, p 476.
7. Karl Marx, "Theories on Surplus Value," "Werke," Vol 26.3, Dietz publishing house, Berlin, 1968, p 290.
8. "Zur Vorbereitung . . .," op. cit. p 35.
9. Ibid., pp 26-27.
10. Cf. Guenter Mittag, op. cit.
11. "Toast by the Chief-of-State of the GDR," NEUES DEUTSCHLAND, 8 October 1985, p 1.

5885

CSO: 2300/74



COMPARISON BETWEEN COMBINES, GOAL SETTING EMPHASIZED

East Berlin EINHEIT in German Vol 40 No 11, Nov 85 (signed to press 14 Oct 85)  
pp 986-991

[Article by Prof Dr Willi Kunz, deputy director of the SED Central Committee's Central Institute for Socialist Economic Management, and by Prof Dr Wolfgang Salecker, department head at the same institute: "Performance Comparison and Best Values as Guidelines"]

[Text] Performance comparisons among and within the combines and the guidelines they give rise to toward best economic values and performances have long stood up very well and have become, especially since the 10th SED Congress, an element of our socialist planned economy one can no longer imagine as non-existent.

Top economic achievements by the industrial and construction combines and their dynamic development in conformity with our party's economic strategy are and will remain of crucial importance for carrying on over long range the course of the principal task in its unity of economic and social policy. For that reason such great efforts have been and are being undertaken in our economy--in line with the 10th SED Congress resolutions--to have the best combines achieve new advances in developing their economic capacity, at the standards of the 1980's, while bringing all combines close to the level of the most successful ones.<sup>1</sup> For that purpose the party congress directive committed the combines' general directors to make full use of the primary intensification factors for further improving performance and efficiency and make effective according to plan reserves for the combines' performance growth by surmounting disparities in the levels and efficiency developments among the combine enterprises. To fulfil that task, performance comparison was extensively turned into an effective method for the political leadership over economic processes in all their diversified relevance. Of decisive importance in having been so thoroughly enforced and having stood up so well are the annual SED Central Committee seminars with the general directors of the combines and the Central Committee party organizers extending the experience exchange conducted, in 1980 for the first time, in that circle. Closely linked with the economic guidelines, decisive political-ideological impulses are coming from them for performance comparisons in the economy and their being fully exploited for improving performance.<sup>2</sup> So they significantly help "bring to full effect the material and intellectual potentials, the awareness factors and the management prerequisites, needed in their full scope in the struggle for best values."<sup>3</sup>



Performance comparison, oriented to top achievements in the implementation of the economic strategy, stems from our socialist production relations--as in fact all performance comparisons and experience exchanges do. It is deeply anchored within the guts of socialist competition, a form of friendly aid and mutual assistance. That holds true for intra and super-enterprise performance comparisons among work collectives in chosen areas of performance and cost trends as for the comparisons of socialist combines and enterprises in their total economic achievements, as sponsored by the ministries, combines and territorial organs. Because performance comparison is connected most deeply with our socialist production relations and is an element of our socialist planned economy and one of the basic planks for constantly striving for higher efficiency, it is no matter of option whether to conduct it or not.

#### Best Values--All-round Orientation

Performance comparison and experience exchange today, when in the implementation of the new phase in the economic strategy that which counts is to ensure the requisite higher intensification level, "and this equally in all sectors,"<sup>4</sup> must more, all throughout the economy, be aimed at

- organizing labor according to the optimum standards,
- surmounting unjustified level disparities by a mandatory enforcing of the best experiences and achieving very broad effects, and
- pushing even the best ones into still higher achievements. As the best units reveal through experience exchange and through the comparison how they achieve international top values by means of science and rapidly utilize scientific-technical data, and what they are doing to organize a high substitution rate for production and manufacture products that meet their acid test on the world market and domestically, their experiences and successful procedures can be generalized and copied by the collectives of other enterprises or combines.

By using the optimum experiences reserves for performance improvements are thus uncovered which will then have to be applied to drawing up ambitious plans or their all-round fulfilment or targeted overfulfilment. Fine results are achieved there especially by those collectives that constantly gauge their own achievements against those of the best units, uncompromisingly make best values their own criteria and then also take a critical look at their own products with a "Q" quality seal as to their use values and costs and draw concrete inferences for their own sphere of responsibility on how unjustified performance disparities may be surmounted.

Such collectives prove by what they do they are truly taking to heart the basic idea behind performance comparisons, which may be expressed by the brief formula of performance growth through surmounting unjustified performance disparities and the use of the optimum experiences. The results they thereby create are not only of benefit to them as such; they also serve the augmenting of social wealth, serve the good of the people. Through performance comparison the experiences of the best ones become apparent to all, reserves exploitable right then or in the future are seen, experience exchange gets concrete substance and targets, and the best ones themselves are spurred into higher achievements. So it is not surprising that in an increasing number of combines and enterprises, as the result of many working people initiatives, time and

again new best values are attained for their crucial performance parameters. That reflects concretely and measurably in economic terms the attainable economic achievements and the grown performance dedication of the working people.

Performance comparison, focusing on best values and the best-worker movement, are of towering importance to socialist competition, its criteria and its quality. This year for instance, at the 10th Berlin Best-Worker Conference, held wholly under the aegis of the 11th SED Congress preparations, new competition standards were set through the commitment made by many collectives in the capital to start working as early as in October 1985 by the 1986 quality parameters. And there the guideline also was hoisted higher when, following the principle "the achievements of the best ones are the criterion for all working people," the best-worker results and those of the top performance shifts were declared permanent achievements on the occasion of the 1985 World Peace Day.

What fine results can come from performance comparisons, experience exchange and best value guidelines is attested to, e.g., by industrial housing construction. Based on a performance comparison among the assembly line collectives of the housing construction combines in our republic, it became possible to reduce the time it takes for completing a dwelling unit at its site from an average 333 hours in 1981 to an average 282 hours in 1984. At the same time a new record was achieved by an assembly line of the Gera housing construction combine, completing a dwelling unit at its site in 1984 in only 246 hours. That now is setting the target for the competition in honor of the 11th SED Congress.

What matters now in the competition for the 11th party congress is to conduct everywhere the effort for such best values and their broad enforcement which conform to future standards and are replicable at will. Only then can one really talk of best values. To get to such values, one must first draw on one's own highest achievements and the best results of comparable economic units as a criterion. What, for instance, are the thus far best results achieved in the daily work output, the time used to make a product, the expenditure in energy, raw materials and semifabricates, the capacity use of installations, or in any other cost and benefit development sectors? Increasing importance there also attaches to comparing the use value and performance parameters of one's own products with international top values.

That is what the 10th Central Committee session pointed out most emphatically. Weight reductions are possible up to 33 percent in electronic mini-typewriters, up to 22 percent in standard gears and swath mowers, up to 44 percent in cassette tape recorders. Energy consumption of rotary pumps could be reduced by some 20 percent, of electronic teletypewriters, up to 50 percent.

#### Important Management Function

In management activity and in conducting socialist competition, a first-rate importance therefore is warranted for the performance comparison among the brigades in each enterprise and among the enterprises and among the combines, and that must be done concretely, accountably, permanently and systematically. The principles to be used in it were explained by Comrade Guenter Mittag before best workers:

"1. A performance comparison begins with contrasting actual results. The decisive major performance rating parameters are the basis. They embody the economic criteria.

Those are statements of concern to every responsible manager and each worker, designer, technologist, plainly everyone in the collective of the enterprise.

2. It is necessary to analyze the causes for still existing performance disparities.

3. It is necessary to work out the conclusions for the change to get closer, in rates and levels, to the best units.

And one thing must always be kept in mind: Performance comparisons that offer nothing but statistics do no one any good. We conduct performance comparisons as a socialist management method; to us they are tools for the political leadership over economic processes and the promotion of the working people's initiatives in the competition."<sup>5</sup>

Performance comparison among and in the socialist combines, as organized today in our economy and constantly being perfected, is an important chain link for ever more effectively and economically combining socialist planning with economic cost accounting and socialist competition. The idea is to approximate, by means of the plan, the economic achievements of all economic units to the top performances of comparable units--mainly the pace-makers. That these pace-makers change from time to time is nothing unusual. Decisive is that we manage to speed up economic development in general and achieve a high level in competition. For that it is necessary to integrate the performance comparisons in the competition and that they be organized by management with clear targets and requirements and an intelligible operations plan.

Such an operations plan must establish how the analyses of the economic achievements measured by concrete coefficients and performance parameters are to be combined with the experience exchange and conclusions are derived therefrom to accomplish best values. Such conclusions on one's own work, oriented to further performance improvements, also are always linked with an educational function, as they presuppose a checking of one's own positions and stimulate a higher collective commitment.

#### Crucial Importance of Expert Preparations for Performance Comparisons

Among the most important experiences with performance comparison in our economy is the realization that its benefit mainly depends on how carefully it was prepared and how resolute its political management was. Preparing the performance comparison ideologically in any given sphere of responsibility, i.e. motivating and mobilizing the working people, arousing their readiness to agree to a performance comparison and take an active part in it, time and time against turns out to be the foremost condition for success. Through clear and concrete economic leads, an unequivocal setting of responsibilities, its activities must purposefully be steered in such a way that the best values ascertained become a standard for socialist economic activity.

Here we have seen that to the extent that performance and efficiency reserves can increasingly be tapped only by a complex utilization of the qualitative growth factors, the importance of thorough analytical preparation for performance comparison grows. A mere comparison of parameters is but a beginning. Only when that is combined with an appropriate causal investigation, a best value guideline and, finally, a concrete exchange of experience on how to achieve best performances, does a performance comparison make sense. Performance comparison and experience exchange pay off best when they--drawn into the conducting of competition--

- concentrate on a few significant parameters,
- display the causes for existing level disparities and explain how what sort of results are being pursued,
- take into consideration diverse conditions in comparative collectives, and
- lead to a mandatory enforcing of best experiences.

### Fields for New Tasks

For performance comparisons and experience exchange to help as much as possible achieve higher efficiency through new technologies and new products and thus fast upgrade production, all the factors affecting these targets have to be drawn on. New fields of experience exchange and performance comparison among and in the combines are more coming to the fore now through the task assigned by the 10th Central Committee session to introduce computer-aided production preparation and control (CAD/CAM) faster and at the economic range. Of special importance to it are:

- experience exchange on preparing the use of economically highly effective CAD/CAM solutions,
- comparing the economic results achieved by a replicated use of CAD/CAM solutions already established in one's own branch, and
- experience exchange on a fast economic spread of proven branch-transcending solutions in computer-aided development, design and project planning (CAD), computer-aided technological preparation, control and production supervision (CAM) and a consistent computer-aided production preparation and control (CAD/CAM).

A fundamental task of socialist management activity is to combine each decisive step in the further implementation of the SED's economic strategy on comprehensive intensification with improving the working people's working and living conditions and with holding consultations with them. That applies in particular to the broad introduction of key technologies and the performance comparison and experience exchange on introducing the computer-aided production preparation and control; for ultimately it is man who, through his experiences, qualifications and skills, will control the degree of effectiveness in which we are applying the most modern technology. Man is and remains the principal productive force. On that realization must every management decision be based. Performance comparison and experience exchange can vastly help shape all working conditions in such a way that man can develop his productive capacities, develop himself as a personality.



## Performance Comparisons Also in the Integration Process

Performance comparison is also used on the international scope, as product comparison. Notably as a standard component of direct relations between GDR combines and USSR production associations such performance comparisons are apt to discover reserves for trimming the expenditures in raw materials, semi-fabricates, energy and working hours for identical products made in enterprises in both countries. The priority considerations there are which energy and raw material savings are possible and how a higher scientific-technical level and better product quality and more rational fabrication can be organized. In these international product comparisons, technical parameters and particular allocations or kinds of allocations are compared in natural terms.

Some good experiences have already come from performance comparisons between GDR combines and their USSR partners. Examples, to mention a few, are the activities of intensification brigades in chemical industrial enterprises in the two countries, the joint preparation and implementation of reconstruction measures in the armature industry, or joint intensification measures in consumer goods enterprises. For instance, through the activity of a joint intensification brigade existing since 1976 in GDR and USSR chemical fiber combines, up to the first half of 1984 a profit of M 16.1 million was shown for the GDR and of R 3.55 million for the USSR. Behind that there stand noteworthy increase rates in labor productivity, reduced raw material consumption, and improving product quality. Similar fine experiences were gained through the longtime cooperation between the Fritz Heckert Combine in Karl-Marx-Stadt and the heavy machine tool association Ivanovo in the USSR. Other GDR combines also have positive results to show for.

International performance comparison under the conditions of comprehensive intensification can effectively contribute to hastening scientific-technical progress and enhancing its economic efficacy by uncovering the causes for existing level disparities when, without any concessions, a comparison of one's own achievements with the partner's spots the weak spots in one's own domain of responsibility and conclusions are derived from that.

Performance disparities will be surmounted all the better, the faster product and technology substitution is pushed ahead in the participating partner countries and the more high efforts of one's own then are coupled with international scientific-technical cooperation measures and production specialization and cooperation. Of growing importance also are technology exchange and cooperation in constructing and exchanging specific rationalization means.

Generalizing good experiences and, in particular, the performance comparison among combines and among their enterprises thus are more and more turning into a major method of competition management. This method has to be extended and further developed so as to meet the growing requirements resulting from comprehensive intensification in the second half of the 1980's through expert socialist management activity.



# FOOTNOTES

1. Cf. Comrade Erich Honecker, "Bericht des Zentralkomitees der Sozialistischen Einheitspartei Deutschlands an den X. Parteitag der SED" [SED Central Committee Report to the 10th SED Congress], Dietz publishing house, Berlin, 1981, p 79.
2. Cf. "Kombinate im Kampf um die Durchfuehrung der oekonomischen Strategie des X. Parteitages" [Combines in the Effort to Implement the Economic Strategy of the 10th Party Congress], Dietz publishing house, Berlin, 1981; "Kombinate vergroessern ihren Beitrag zur Erfuellung der Beschluesse des X. Parteitages" [Combines Are Boosting Their Contribution to Fulfilling the 10th Party Congress Resolutions], Dietz publishing house, Berlin, 1982; "Neue Initiativen zur Erfuellung der Beschluesse des X. Parteitages" [New Initiatives for Fulfilling the 10th Party Congress Resolutions], Dietz publishing house, Berlin, 1983; "Nach neuen Masstaeben der Intensivierung umfassend organisieren" [Comprehensively Organizing by New Intensification Standards], Dietz publishing house, Berlin, 1984; "Mit hoechsten Leistungen den XI. Parteitag vorbereiten" [Preparing the 11th Party Congress with the Highest Achievements], Dietz publishing house, Berlin, 1985.
3. Comrade Joachim Herrmann, "Aus dem Bericht des Politbueros an die 10. Tagung des ZK der SED" [From the Politburo Report to the 10th SED Central Committee Session], Dietz publishing house, Berlin, 1985, p 120.
4. "Zur Vorbereitung des XI. Parteitages der SED, Aus der Rede des Genossen Erich Honecker, 10. Tagung des ZK der SED" [In Preparation for the 11th SED Congress--From Comrade Erich Honecker's Speech--10th SED Central Committee Session], Dietz publishing house, Berlin, 1985, p 27.
5. Guenter Mittag, "Ninth Berlin Best-Workers Conference, 3 September 1984," published by the Berlin SED Bezirk Management, pp 44-45.

5885

CSO: 2300/74

## GERMAN DEMOCRATIC REPUBLIC

### TECHNOLOGICAL DEVELOPMENT, INDUSTRIAL BENEFITS CITED

East Berlin EINHEIT in German Vol 40 No 11, Nov 85 (signed to press 14 Oct 85)  
pp 992-996

[Article by Prof Dr Siegfried Schiller, deputy director of the Manfred von Ardenne Research Institute: "Foremost Technologies Demand Daring"]

[Text] Carrying on the principal task policy calls for economic growth through permanent comprehensive intensification. Labor productivity has to be boosted vastly. Comrade Erich Honecker made a special point of that at the 10th Central Committee session. At the same time we have to produce everything in our country by exponentially raising our mental exertions, trimming material and energy consumption, and yet achieving high-grade end products. We thereby adapt ourselves completely to our raw material situation. While we have made considerable progress with our consumption standards, a comparison with international top values yet gives us no reason to be smug about it. For multi-layered improvements there still are many chances. To keep in step with developments we have to make use of them. The more consistently we move that way, the better will our economic headway be, and the more improved will also be our position on the international markets, where competition keeps getting tougher all the time.

An international technological race is on on a broad front. Economically important, it is also of ideological relevance. Not only we are aware of that. The forming of opinion about the advantages of our socialist planned economy in the end--to be perfectly prosaic about it--will also be affected by the level and prices of products we are putting on the market. Domestic and foreign customers then become our ultimate judges. Everything else in between are only "tentative grades." So it does indeed make sense to ask oneself the question: "Would you like to be your own customer?" A buyer will always apply the international yardstick. If we stand up to comparison we have won, together with the economic, an ideological battle. The all-inclusive raising of the level of our technological output thus becomes an outstanding political task.

### Economy Is Part of Top Performance

Public interest has been confronted for some time with such terms as top achievement, top technology, pace-maker technology or key technology. They

all express that that that they refer to towers over the customary, the long established, is nothing average. The term top technology implies industrial use. Initially that reveals nothing about the use of new working principles or the degree of intricacy in the developed technology. True is of course: the simpler the better. Current and probably also future development is marked, however, by the transition from the simpler to the more complicated. Working principles not known hitherto, forgotten or, simply, not yet used are being readied for production or transferred to other industrial branches. New, more complicated and mostly also more expensive means of production evolve. More demands are raised for a high degree of scientific infusion throughout the entire production process. The multilayered technological perimeter, controlled by ancillary supplies of all sorts, must be adapted in its level. Another decisive prerequisite lies in the expertise of the people involved in the development and production. Strict technological discipline is required throughout. High demands are made on the educational system. Yet these prerequisites in their complexity are what make the development and application of high-tech possible in the first place.

A typical example of high-tech is the whole cycle that produces microelectronic components. In the process of miniaturization, new generations of technological special equipment were needed step by step, which did not just amount to further development. For example, right now more of a use of plasma processes is indicated. Because of a transition to smaller structural measurements, as the wavelength of light is too large, the use of X-rays and electronic rays is necessary. The production conditions differ from the ordinary there. The high and still rising pure space requirements visually illuminate this development. There is no other way but high-tech for producing modern microelectronic components. Other reasons arguing for the introduction of high-tech are the higher labor productivity, the reduction in environmental stress and material substitution.

An example from our own field of work was the use of the plasmatron sputter to make general-purpose mirrors. This way one can substitute aluminum for silver. The process can be automated and is friendly to the environment. A similar reason induced the introduction of the vaporization technique for strip steel with aluminum. Its purpose was to save tin.

Various modern technologies are radiating into broad areas of industrial production and can thus become pace-makers for the entire economy. This is expressed by the term key technology. "The name 'key technologies' does not seem badly chosen to us," Comrade Erich Honecker said at the most recent Central Committee session, "as its application, after all, is supposed to unlock the door to an economic future with powerful growth, more and more borne and encouraged by high-tech."\* Microelectronics has such a key function. That is why our party pushes it so much. The rapidly developing biotechnology is also likely to come to play such a central role. The boundaries for the designations and for what they contain are fluid, of course; something that is the top or high-tech does not stay that way forever. The measure is always taken from highest standards in the world. Yet not merely the technical

\*"Zur Vorbereitung des XI. Parteitages der SED, Aus der Rede des Genossen Erich Honecker, 10. Tagung des ZK der SED" [In Preparation for the 11th SED Congress--From Comrade Erich Honecker's Speech--10th SED Central Committee Session], Dietz publishing house, Berlin, 1985, p. 31.

parameters must be adduced as judgment criteria. The whole effort behind it must be put into the scale too. Much helps much is not the particle's solution. Technical feasibility always implies its being economical; that is of crucial importance. How one can arrive at top technologies and cope with high-tech I shall comment on in the following, referring to typical attacks in risky applied research projects our institute took part in. It was all worked out through close interaction with the given user combine. Operational prerequisites differed significantly, so that, with respect to the results, there is no way of pointing to particulars in one or another industrial branch or, let alone, our own institute.

### Nothing Venture, Nothing Gain

In the early 1960's, following a pilot phase, melting by electron beam was brought to industrial maturity together with the VEB Hans Böckler Combine for Locomotive Construction Electrical Engineering Plant (LEW) in Hennigsdorf and with users in the GDR. This method also went through rapid development internationally. We were by no means the only ones. Which is not so rare anyway. At least there are competitive methods then. But we, motivated by a number of secondary conditions, sought solutions differing from the international trend. Particularly we had ventured in the GDR to deal with the megawatt class with only one electron gun. It did not all work as anticipated. Side effects played a bigger role than expected; in fact, they had to be cultivated for the whole thing to function in the first place. Not only the electron beam technique had to be brought to industrial maturity. The project had given rise to the whole vacuum technique in a different order of magnitude. The many new component groups in the installations went through their ordinary infants' disorders. The first industrial installations were built in the Freital refined steel plant. In parallel with their being refined, we got ready for having the LEW Combine Hennigsdorf ship a larger number of installations to the USSR. The risk was great. One had to cope with lots of doubts. Which got completely done away with, of course, when the actual, and considerable, benefit surfaced later. It is an observation I have made time and time again: when thrusting into virgin territory one must not shy away from difficulties and reversals if one wants to reach the top. As the saying goes: nothing venture, nothing gain. He who hesitates is lost. The 1.2-MW plant installed 20 years ago in the Freital refined steel plant is still very economically being operated today. The Hennigsdorf LEW Combine has been supplying the entire CEMA region with electronic beam melting installations for decades. Even in the United States and Japan, the GDR holds an acknowledged market position. It can do business for good hard currency profits, small successes being, after all, the criterion for judging a performance level.

As a young physicist I had the opportunity to be around from the very start under Prof Manfred von Ardenne's immediate management. Especially the transfer activity, the testing phase of the installations and being involved in the export were to me a school for life. I was closely involved in the multi-layered problems connected with the industrial utilization of science data; my eyes were opened to economic contexts. To learn to swim you will have to get into the water. Therefore we offer the opportunities to broad circles of associates in our institute also to gather that kind of experience. Practice alone will teach you how tough the application of science data is--and the



plan is supposed to get fulfilled and you often have to cope with wholly unexpected situations. And your mood goes up and down accordingly. This calls not only for technical and organizational talent, but for qualities of character as well. Capabilities for collective labor and the determination to do something extraordinary for our socialist society play a very big role. A fundamentally optimistic stance, the strength in making decisions and a readiness for risks are needed to stand up to often complicated situations. Pushers are needed, not reinsurers. Still today our associates gain in their human and scientific maturity through such operations. And from one's own experience one then comes to know: the moment of truth for something lies in its successful production.

#### Top Achievements Must Be Wanted

The experiences we gather in the application of science data in industry are priceless to us. When the testing of the production line in vaporizing strip steel with aluminum got started in 1970 at the Bad Salzungen cold-rolling mill, we ran into the normal "surprises"--not in matters of principle, to be sure, but, as so often, in the form of interfering side effects, the thousand and one little items one had not thought of or could not have thought of because only under production conditions it is that they surface. Quite a few sought to edge out of that tough situation; no one wants to have caused it, after all. In the end, everything was all right. After the installation had been producing successfully for 10 years, the Eisenhuettenstadt strip steel combine decided to build a new and more productive production line. That demonstrated the self-assurance and daring of the combine management. For nearly 15 years, nowhere else in the world was a production line like that being operated. Again this case confirms: Going it alone has many thorns; out of the world fund of knowledge one can take nothing for it. The concrete conditions in the GDR, for all that, called for self-reliant solutions. Now international interest has been roused by the higher demands that are being made on relieving environmental stress. Now our high state of development pays off.

In the process of work the collectives were welded together. Both sides--research and production--have learned much from each other. Our institute realized what can be done under the raw conditions of metallurgy with the vaporization technique and electron beams; the collectives in the cold-rolling mill now understand better what high-tech and rigorous technological discipline mean. And there are still many other lessons we can learn from this and many other research projects. Time and again I could observe that many important recommendations and suggestions for basic research are coming out of production. So industrial science does not infrequently run ahead of basic research. The whole thing is an interesting process, a sort of "chicken or egg" problem. When you want to get to top technologies, you must not expect smooth sailing, but you must hold on to the motto, "nothing venture, nothing gain," and hold in readiness the willingness to take risks. Asking for risk readiness means rating daring highly and accepting failures. That must be the guideline for a manager or customer in defending or judging an outcome. That, however, is not a question, in my view of new regulations and new economic handles. The correct attitude is what is wanted: One must seek a top performance.



## For Chopping Wood, Each Must Use the Axe He Has

Frequently we are facing the question as to where our own ways are called for and where one absolutely has to follow the international trend; self-reliant solutions we need, but not eccentric ones. The economy as a whole may press for technological solutions different from the ones internationally observed, and operational conditions play a role in this too. That is the situation the Hermisdorf ceramics combine found itself in when seeking a technological conception for making microelectronic circuits by hybrid technique. Internationally, relatively small and medium-size enterprises are the rule for it. The equipment used for it is adapted to it. In Hermisdorf, however, the hybrid technique is concentrated like nowhere else in the world. Thus the technological concept in the GDR had to be subordinated to our specific conditions. Other special conditions lay in the availability of certain plant systems and raw materials. Internationally, the thick layer technique based on precious metal pastes plays a much greater role. For structuring and trimming, laser installations predominate in other countries. The GDR, on the other hand, concentrated more on thin layer technique. Electron beam installations take on the structuring and trimming. This development, adapted to the economic structure, was, moreover, favored by entirely pragmatic reasons: our own institute could develop and build the proper installations for this self-reliant technological concept. We did not have to copy anything, and we got along on fewer exports. Of course, the implementation phase was not wholly devoid of conflicts. You have to have a goodly amount of self-assurance if you want to reach top positions. The Hermisdorf and Dresden collectives did not let themselves get irritated. The GDR found its own solution; with the technological status it has reached we can face the world.

## Even in High-Tech, Man Is Decisive

The specifics that come in with the use of high-tech can be made out clearly only after getting started on them. What reorientation in thought may be tied to its introduction, was shown to us in the use of the vaporization technique and sputtering in the smaller glass enterprises. In the end those enterprises could no longer be recognized for what they had been before. Transfer activities, along with the technical problems, often mainly also mean new organizational forms, enforcing a strict technological discipline, and training manpower. The tasks to be solved in it were extremely multifaceted. Men, typically, need some time to learn to cope with technology and installations because running the operations comes under the influence of many factors of which by no means all can be accounted for through measurements. Any deviation from intended parameters--at times not even subject to verification--may infringe on the volume and quality. The man-machine system becomes coordinated slowly, step by step, until man ultimately becomes the true master of high-tech. A stable staff of associates, long years of experiences, and painstaking detail work play an enormous role in that. The subjective factor deserves the greatest attention in high-tech production. You have to have a specific attitude toward high-tech.

## When You Want to Be Among the First, You Have to Start with the First

What then is the international trend? That often becomes controversial. One has to take into account that which is actually being done and what presumably may soon happen. About much that is being written one ought to ask: Is it actually possible for a firm that is not in full control yet over a novel procedure and has invested a lot of money in another one to promote the new one? Take the plasmatron sputtering, a novel base technology for vacuum coating. In retrospect it is all the more evident to me that we were well advised not to let ourselves get confused by the views of foreign firms. When around 1974 the new coating principle was seen nowhere yet on the horizon, we got started. Initial experimentation convinced us a transformation of vacuum coating was at hand which we should not miss but could not cope with all by ourselves in our institute. Cooperation with suitable industrial partners had to be organized in good time. Together with the Dresden Center for Microelectronics Research and Technology, we started developing a new installations system long before the market situation was clear. Operations were agreed upon with several user enterprises before one could predict the effects in terms of dollars and cents. Large sectors in the institute had to be revamped. Fast action was the order of the day. And the project took off the normal way. Some stormed ahead and fought, others waited to see how it would come out. Meanwhile plasmatron sputtering has become an established procedure. The economic benefit from it is enormous. The GDR has a leading position in the research and, still more importantly, in the application. The scientific infusion proceeds step by step, intertwined in time with industrial use. Analogous developments are found elsewhere in installation development and technology. Though much has already been accomplished, we are only at the beginning of a magnificent development. Another reason to reiterate: A scientist has the duty to bring things in. He must do and propagate what is about to become important.

From all these examples one can draw one conclusion: The way to the top just is not coated with asphalt. Hard work alone gets you ahead. The larger the step, the greater the risk. If we want to come up with top technologies at acceptable costs, we have to embrace risk in word and deed. While thrusting into virgin fields, many rocks are found lying in the way which has to be cleared. Enthusiasm and some fighting spirit belong to it. And that has always been so perhaps. Nothing novel comes by itself or automatically.

5885

CSO: 2300/74

COMBINE OPERATIONS, EFFECTIVENESS DETAILED

East Berlin EINHEIT in German Vol 40 No 11, Nov 85 (signed to press 14 Oct 85)  
pp 997-1000

[Article by Prof Dr Hans-Joachim Beyer, research program head at Institute of the Political Economy of Socialism at the SED Central Committee's Academy for Social Sciences: "Experiences and Requirements of High Flexibility in the Combines"]

[Text] As our economy is resolutely orienting itself to comprehensive intensification for good, the combines and enterprises are seeking, with success, further to raise the flexibility and reaction capability of their reproduction process, as fast and flexible reaction to the new requirements of the scientific-technical revolution, to public demands, to the demands of the new level in socialist economic integration and the tougher international market conditions contains the decisive conditions for higher effectiveness, key issues for economic growth. These efforts are directly linked with the task not only to keep in step with the international rate of development of the productive forces, but to maintain top positions in crucial areas and reach more top positions in others.\*

For the combines and enterprises that mainly means giving the time factor its full dues and resolutely leading the science--technology--production cycle all the way to sales, to the effective realization of the results. How the teamwork of the various reproduction phases is controlled, how the overall cycle is abridged, and how we succeed in entering the market with new products, proper as to timing and needs, that significantly controls the economic utilization of scientific-technical achievements and, altogether, the effectiveness within the economy and the economic success on foreign markets. Growing flexibility and reaction capability must therefore be understood as the fundamental demand raised by comprehensive intensification, which enjoys a high place value in our intensification-oriented socialist planned economy.

---

\* Cf. Erich Honecker, "With Revolutionary Elan, Our Youth Is Fashioning Our Socialist Present and Future," NEUES DEUTSCHLAND, 1 October 1985, p 4.

To ensure the high dynamics of economic development also for the future and, as Comrade Erich Honecker has demanded, to speed it up in a targeted fashion, the combines confront ambitious tasks proceeding from the sales phase of the reproduction process, in that sales-oriented thought and a flexibility and reaction capability that cover all phases of the reproduction process are imperative. While we are constantly perfecting our planned economy, favorable prerequisites are created for having our efficient combines meeting those tasks. Each combine's own research and science potential, its modern rationalization means construction, its far-reaching authorities in sales and foreign trade activity, and the high direct responsibility each individual combine enterprise has offer fine opportunities for reacting flexibly to market requirements. That concern was effectively aided by the comprehensive measures for perfecting management, planning and economic cost accounting, conforming to the requirements for economic dynamics; through making more use of balance-sheets as immediate management tools; through operations planning oriented to production proper as to contracts; through the highly meaningful type of performance rating by way of the parameters of net production, net profit, and products and services for the population and for export; through stimulating novel products; and through the forming of funds and other regulations.

In the combines and enterprises where advances in their reaction capability were clearly noted one consistently saw to it that new sales requirements were presciently spotted and taken account of from the outset in the commodity conceptions. Combines and enterprises that have made good headway in product substituting and have thrown genuine top sellers onto the market have concentrated their efforts on a pervasive partnership between R&D, production and sales. They are making use of well tried forms like world standard bureaus, complex market research groups, sales counseling centers and such. Important as it is to select the most suitable form of organization, what is ultimately decisive are the criteria set in management. On them mainly depends that the customers' preferences are taken more carefully into account, that there is a faster reaction with original scientific-technical solutions to changing demands, and that sufficient attention is paid to quality stipulations and sales arguments. More must be done to make the whole reproduction process more receptive to new sales requirements, which confronts R&D as well as sales sectors equally with higher demands. Comrade Guenter Mittag, therefore, called the connection of science and technology with production and, beyond that, with sales, to achieve good economic results, the key question about quality in combine management. The art of management, he affirmed, was to manage those sectors not in juxtaposition, but together. When designers and developers, e.g., get directly drawn into sales talks and instructional counseling with the customers, they understand the market requirements better and their personal willingness grows to face the higher performance demands and, in particular, share more of the responsibilities for business objectives. Good experiences in combining technical and business requirements more closely with each other were gathered in places where R&D personnel, before assuming a responsible function, would work temporarily in market research or technical-commercial bureaus abroad.

\*Cf. Guenter Mittag, "The Meaning of Our Policy: Everything with the People, for the People." NEUES DEUTSCHLAND, 21/22 September 1985, p 5.



International experience informs us that many productive ideas come from customers and ancillary suppliers. That makes it all the more necessary to follow the example of progressive combines and enterprises where there is now a greater influence by the sales sector on drafting basic management documents such as the refinement conception or the long-term product assortment concept. That presupposes of course that suggestions ripe for decisions and satisfying high demands are presented in good time from the vantage point of sales. Using market information that becomes available merely for current market efforts or temporary adaptation tasks in R&D cannot satisfy such requirements.

Effective market research is a basic requirement for production proper as to demands, high economic effectiveness and profitable foreign trade. This applies, as Comrade Erich Honecker has stressed, to a special degree also to consumer goods production and is wholly in line with our course of the principal task. "Focusing on changing requirements, ascertaining them thoroughly, and precise and relevant market research are essential for effective policy in this sector."\*

Through market research above all proposals ripe for decisions for new products have to be worked on. R&D and sales together therefore are developing joint sales conceptions for each new product in a number of combines. That enforces more product-related labor that makes a difference especially when the sales sector gets more of a say-so during the defense of the tasking workbooks and when the profitability and sales conditions are placed under thorough scrutiny.

Flexible reaction to customers' preferences as required today starts with top achievements when offers are made. The international reputation of a new product stands and falls with that, as it increasingly depends on it whether an export deal can be made and at what price and profit one can sell. If one underrates the exigencies in making bids, then ultimately the efforts to improve the scientific-technical level of the products do not fully pay off either. All the greater importance is therefore warranted for the initiatives in combines and enterprises at greatly cutting back time frames for making bids so as to conform to international standards. Here one finds still unexplored opportunities for innovator activity in the field of making bids.

Sales activity that wants to meet high demands requires a broad palette of bids today. A greater matching capability of new products for complex processes, modernized additions to equipment shipped earlier, and an adequate range in offering nonmaterial achievements constitute decisive criteria for international competition. They are of the same great importance for economic intensification as for export. Such new trends, however, presuppose considerations on how to profile production later on: How can assortments be broadened based on construction lines so that multivalent effects are achieved?

---

\*"Zur Vorbereitung des XI. Parteitages der SED, Aus der Rede des Genossen Erich Honecker, 10. Tagung des ZK der SED" [In Preparation for the 11th SED Congress--From Comrade Erich Honecker's Speech--10th SED Central Committee Session], Dietz publishing house, Berlin, 1985, p 29.



How can one admit to the production program upgraded designs which also prove a first-rate sales factor on the world market and can no longer be imagined not to be a part of complete delivery bids? How can a bid be shaped to take care of special customer problems that would include all sorts of nonmaterial services?

To be able to make attractive bids absolutely presupposes a flexible production reacting to a fast start and rational design of production adapted to the market requirements. Enough units when production starts, shorter delivery schedules in general, customer-specific solutions and bids for assortments that can always be supplied signify the new demands made on performance. Still exceptional a few years ago even for "broken in" mass production, such claims are now becoming more and more normal requirements, crucially affecting efficiency. Customer options like that have effects, of course, that are going back to production, even to R&D.

The ideological position taken on solving such novel and unconventional tasks therefore is of decisive importance. Beaten tracks in management, notions such as that "special customers' wishes do not suit the profile of an enterprise" are not appropriate in any way. Above all any given manager's own responsibility must be strengthened in being able to decide fast, accurately and consistently.

A greater production capability of production was achieved especially in combines and enterprises where product development and future production are prepared and managed in a unified process. They take for granted that top achievements must keep in step with international standards for bids. Through systematic rationalization of production preparation, conversions in production organization, revamping the work force and concentrating of able cadres they managed to surmount the production time frame and enlarge the assortments offered. The results in these combines and enterprises show that successful export activity can no longer do without solutions that are made customer-specific and are tailor-made to any case that occurs, including the regard for the option to have specifications changed. Production also becomes more flexible by using the prefab system of construction with subsequent adjustments, partly still during the assembly, which is good for improving the exportability.

The VEB packaging machinery plant in Cresden was able to reduce this way the time from customer inquiry to starting production for customer-specific solutions from one year to a few days. The total production period was reduced to one-fifth and the number of commissions to be handled simultaneously was raised from five to 42. VEB Mikromat, by largely keeping the testing of important machine construction groups in parallel, managed to reduce the time up to starting of the installations by 43 percent while expanding the time for permanent tests threefold. Similar information could be adduced from various industrial branches.

Not only adequate production capacities, but also appropriate capacities for project planning and a technological lead are imperative for ensuring a high reaction capability and the economically most favorable pick-up of production. As this not rarely involves bottlenecks, those combines are well advised that recruit suitable cadres from R&D and from prototype or rationalization means construction for these tasks, that create rationalization solutions and assign specialists with a broad occupational profile and a sympathetic understanding of technology.

When customers ask for special orders, efficient solutions can be found most readily if they include the mass production advantages of the major production line. Ultimately the point is to develop organizational forms for production that come down to greater flexibility by the combines and enterprises as such, not only to a modernization of the production organization, but to a higher quality in project planning and technology, the materials economy, and the maintenance, transport, transshipment and storage processes.

A good performance deal indispensably includes a high reliability of product quality and a spare parts availability and repair and other services at top level. A systematic transition to complete controls at the finish and using the opportunities for zero-fault-production take account of this requirement. These high criteria have to be applied all the way to packing and shipping because even the smallest negligence ultimately leads to delivery delays, higher costs or complaints. The sales sectors constitute an outspoken priority for the rationalization strategy of the combines and enterprises. Just as in production the increasing performance requirements here also have to be met through rationalization: starting from a smooth labor organization down to ADP operations not a single measure must be given away. The spare parts economy calls for special attention. Its complex rationalization in connection with proper stock-keeping including production control gains time and brings efficiency benefits. A proper ADP project, e.g., made it possible for an important installation supplier to cut the time it takes to work on spare part orders from several weeks to but a few hours. This project contains complete offers of all spare parts with precise delivery possibilities and price calculations in the various currencies from a spare part catalogue containing over 12,000 items. Possible also are assessments of the spare part requirements the customers will have.

A close cooperation among all phases of the reproduction process presupposes targeted political-ideological leadership activity which sees to it that all managers and associates of all technical sectors fully adapt themselves to the new sales requirements. Developing business flexibility and inventiveness, foresight, a business sense, commitment and the ability to carry things through, and promoting cadres who have such abilities and talents, must be regarded as equally important as promoting the gifted in technical and other fields of work. The point is, after all, closely to combine, for the sake of a high performance growth, the scientific-technical with the business aspects of the work.

FRG DAILY ASSESSES ECONOMIC INNOVATION POTENTIAL

Frankfurt/Main FRANKFURTER ALLGEMEINE in German 4 Dec 85 p 13

[Article by Hans Herbert Goetz, datelined Berlin: "No Experiments in the GDR"]

[Text] In what direction will the economic order in the GDR continue to develop? This question arises a few weeks before the end of the 5-year plan (1981 to 1985), and a few months before the party congresses in Moscow in February and in East Berlin in mid-April. Right now the basic lines are being determined, to be approved unanimously by the delegates to the party congresses and then to be formally passed by the People's Chamber. In these weeks, "worthy preparation for the SED party congress through top performance" is the slogan in the GDR.

What the party congress in Moscow will decide is not yet as clear as in the GDR. Publications about the last meeting of the SED Central Committee have reinforced the impression that the SED--very different from the large fraternal party in the Soviet Union--does not have to rack its brain about fundamental reforms--whatever reforms may mean in the reality of existing socialism. In the GDR, at any rate, corrections which deserve the name of reforms have always failed in the past, the last time in 1971.

Different from a few years ago, the report of the SED Politburo to the Central Committee was essentially a report of successes which stated only a few, albeit obvious, weak points. And if one reviews the results of the meetings of Western GDR researchers in West Berlin in recent weeks, who tried to evaluate the economic situation of the GDR at the end of the third 5-year plan of the Honecker era, it becomes clear that the majority of the researchers see noticeable progress in the GDR economy. This evidence regarding the growth rate, increased work productivity, and increased performance in agriculture or transportation is valid, even if the disparity with the FRG continues to be enormous. If anything, the difference in productivity between the two German states is becoming greater.

Despite some successes, such as reestablishing the confidence of the international banking world through a "hard line" import policy, the last years have dealt some blows to the GDR. Updating of the production apparatus, in part obsolete, becomes ever more urgent; the GDR, which had

to cut back its investments drastically, must invest more during the upcoming 5-year plan if it does not want to risk the success achieved so far. Although they are justly proud that the country has managed to attain foreign trade surpluses in both East and West during difficult times, it is simply grotesque that a developed industrial country such as the GDR, which can manufacture the most modern machine tools, earns about one quarter of its foreign currency through gasoline exports!

Also, the GDR population has benefited very little by the greater growth rate, not to mention the fact that the difference in the level of affluence and quality of life between East Berlin and villages in the Erzgebirge or in the north continues to be considerable. Thus the GDR population expects something from the party congress. At the last meeting of the Central Committee, for example, it was openly stated that the supply of spare parts, or of textiles in demand, continues to be unsatisfactory. What good is a car without a V-belt, or if the exhaust cannot be replaced?

In Moscow, the die has not yet been cast on a new and more effective economic policy; the coming weeks will have to provide information. The Hungarians evidently have permission to continue their market economy experiments, within limits. Are such relaxations also conceivable in the GDR? The answer is No, and this No can be substantiated by a short review of the economic history of the GDR.

If Dr Guenter Mittag is the chief architect of the economic policy of the Honecker era, then Professor Dr Otto Reinhold, for almost 25 years the director of the Academy for Social Sciences at the SED Central Committee, could be called one of the "chief thinkers." As early as 1973, Reinhold addressed the subject in the GDR which only today is being moved into the foreground in the Soviet Union, i.e., "intensification" of production or, in simpler terms, reduction of the "tonnage ideology." The SED Politburo stated already in 1974 that the question of intensification and increased effectiveness of the GDR economy arises "with totally new urgency." At the beginning of 1978, Reinhold again dealt with this subject publicly and outlined the basic line of future SED economic policy. If this same Professor Reinhold now makes statements in the influential SED journal *FINHPIT* about future economic policy, one may be permitted to conclude that this statement is made "ex cathedra." Reinhold made it perfectly clear that no one could "seriously assume that, having successfully carried out the transition from capitalism to socialism and possessing a functioning and proven system of socialist planned economy, we will reintroduce capitalist conditions and methods through the back door, so to speak..."

So everything is clear: no experiments with the socialist planned economy. But that cannot mean that the SED, fully satisfied, can rest from its labors. It is naturally aware of the ineradicable weaknesses of its system even if, within the East bloc, it is in the best position to solve its economic problems. It is probably also aware that it imposes sacrifices on its population with the system of planned economy--not to

mention non-economic sacrifices, such as the impossibility of traveling to the West.

Werner Jarowinsky, head of the "Trade and Supply" department in the SED Politburo, made it clear to the Central Committee in what manner the SED wants to improve the instruments of its planned economy. In "market economy terms" one can say that the SED is capable, and not without success, of inventing ever new substitute mechanisms which are to accomplish the same as the "devilish" market price mechanism, but of course without adopting the latter.

But there are "substitute and remedial measures," for example, raising and lowering fixed prices on a more regular basis; and in place of freedom of trade, faster and more generous operating licences are granted. However, these substitute measures become effective only when people "work along." To see how it really works, one has only to visit a GDR cabaret or to see Soviet authors in one of the good theaters in East Berlin who, with the greatest frankness and amid roaring laughter, poke fun at the planned economy.

7917  
CSO: 2300/92



GERMAN DEMOCRATIC REPUBLIC

NATURAL GAS FUEL-SUBSTITUTION STUDIED, USED IN MOTOR VEHICLES

Leipzig ENERGIETECHNIK in German Vol 35 No 5 May 85 pp 195-99

[Article by Gert Walter: "Technical Solutions for Using Natural Gas as a Fuel for Motor Vehicles and Experience in Operated Motor Vehicles Converted to Natural Gas in the Energy Industry of the GDR"]

[Text] The energy situation is forcing all countries to devote increased attention to the questions of the use of energy in the economy and measures affecting energy policy. The conditions for meeting needs are acting as a strong stimulant for methods by which the reduction of energy consumption generally or the replacement of specific, particularly valuable energy sources will be brought about.

Among these measures is the replacement of carburetor fuel (gasoline) or diesel engine fuel (diesel) by means of what are called "alternative fuels." The reasons for the substitution of gasoline or diesel fuel can be found both in the price relation and in problems of the autonomous disposition of certain energy sources.

In many countries vehicle manufacturers and the pertinent branches of industry are experimenting with various propulsion systems and fuels to come up with an economically viable alternative to the piston engine powered by gasoline or diesel fuel.

The area of greatest priority is the range of alternative fuels to gasoline and diesel, in which high methane-content natural gas or equivalent biogases and/or sewage pit gases have the edge. An additional basic aspect is integrating the alternative fuel chosen into a technical-economically effective system for driving and refueling. The planned variations in use--for example, long-distance or local traffic and/or line operation in inner city transportation--can influence the operating system greatly.

The term "alternative fuels" indicates that technical solutions for a fairly broad range of fuels are available or can be developed, but which have to be subjected to an evaluation and/or giving a ranking in accordance with the economic conditions of the moment and the realities of the national economy. From today's perspective, the use of:

- liquid gas (propane/butane),
- gases taken from the public supply, particularly valuable imported natural gas,
- biogas/sewage gas,
- carbon gas or similar generator gases,
- acetylenes and hydrogen

suggests itself for our purposes.

The operators of large transportation companies, particularly of community organizations and local transportation operations, are increasingly giving consideration to high methane-content natural gas. Corresponding conditions with respect to deposits and the possibility of importing natural gas can make using it in this way for motor vehicles economically interesting in other countries as well.

Naturally, the cost of finding a technical solution for engines must be considered in conjunction with the application of systems for driving and refueling that are technically and economically effective.

Interesting studies and operational experience already exist in various countries which prove that other pressure ranges, besides the previously employed method of high-pressure refueling at 20 MPa, can be extremely economical. The advantages of a different method, operating at 2.5 MPa for natural gas, can be seen from the following technical explanations.

## 2. Knowledge Gained Before the Start of Technical Development and Realization

The Institute for Energy Supply has been carrying out intensive studies on the use of natural gas, coal gas and liquid gas as alternative fuels. Now not only technical solutions but also extensive operational experience and results that can be evaluated are available.

In addition, the implementation of the complete system for transportation and refueling--from the problems of the refueling installation to training the drivers and repair personnel--was carried out responsibly by the Institute.

Weighing all the technical-economic factors and taking all the requirements of the national economy into consideration, the preferred alternative for the GDR's energy industry was the initial use of natural gas, utilizing primarily direct fueling of vehicles at 2.5 MPa from the natural gas network, and work began in 1983 on putting this choice into effect.

A study determined that:

- the operating range of these vehicles as a rule is less than 80 kms/day,
- the tonnage capacity of the vehicles is determined by their operation and/or use and is usually less than 80 percent of the maximum payload,
- a pressure level of 2.5 MPa guarantees a range of about 100 kms, with an additional load resulting from the fuel containers of less than 15 percent of the maximum payload,

- a pressure level of 2.5 MPa does not require any special expenses for compressors and avoids additional safety risks,
- the refueling points in the natural gas system are normally less than 60 kms apart,
- a fueling operation takes less than 10 minutes.

In proposing this solution, the assumption is made that:

- the energy combines themselves are the operators and owners of the natural gas pipelines and therefore of the refueling points,
- the vehicle drivers belong to the energy combines, and therefore the appropriate additional regulations for the labor contracts on driver refueling can be drawn up,
- unified management of the operational and control system by means of central directive is possible,
- conversion and maintenance can be carried out in the vehicle workshops of the energy combines.

Furthermore, all the conditions exist for the unified management of the entire technical-organizational flow--starting with development, going on to ensuring supplies of material and personnel training down to drawing up regulations and types of refueling points.

The use of alternative fuels in motor vehicles must not be considered in a one-sided fashion, only from the point of view of vehicle propulsion or even of engine development, rather at the same time the entire problem of material supply, in-house manufacture of special parts for conversion and maintaining spare parts, including ensuring repairs, all the way down to the problem of refueling must be solved in accordance with optimal criteria.

This includes the training of personnel to carry out conversions and repairs and, to some degree, of the drivers as well, and it is necessary to define accurately the body of regulations from operating instructions for the vehicles to the organization of the garage and to adapt it to local concerns.

With these facts as a basis, the Institute not only developed the technology of the vehicular solution, but also worked out a practical and economically very interesting method for refueling, that is, the construct of a system of transportation and refueling. The core of this system is direct fueling of the vehicles from the natural gas pipeline network at 2.5 MPa, without any additional increase in pressure using compressors. Let it be determined that as the result of a fundamental decision, the use of imported natural gas was established for vehicle operation and no initial consideration was given to the use of coal gas as a means of propulsion.

Another precedent-setting decision was the primary consideration given to the conversion of gasoline engines, because it was possible to find a quick, practical solution and it was possible to convert the engine in the simplest way, i.e. at the lowest cost.

### 3. Explanation of the Principle of the Engineering Solution

The propellant gas installation is registered in the GDR under permit IEC A 1 Nr 1768 from the Automotive Engineering Office. The Institute for Energy Supply is the holder of the permit. Fig. 1 shows the main elements of the solution.

The pressure tank has been approved by the GDR's Technical Inspection Administration under the designation "pressure bottle with increased volume" and it is manufactured in two sizes in a factory licensed for the production of pressurized gas containers (Table 1).

Table 1.

Diameter in mm	Geometric content	Weight in tons	Pressure in MPa
800	0.92	0.410	2.5
500	0.90	0.185	2.5

For the NW 500 size, two containers are normally mounted lying side by side.

Attachment to the vehicle frame is by means of bushings with crossbracing in accordance with automobile industry regulations. The tank connector and the antifracture for the lines are manufactured as separate components.

The pressure reducer is designed for an input pressure of 15 MPa and is specially adapted for operation at 2.5 MPa. Pressure reduction is carried out in two stages. The second stage can be regulated. A gas pressure regulator from the GDR's delivery program was converted as an engine regulator and its curve adapted to the special requirements of engine operation under vacuum. Input pressure for this regulator is 0.02 to 0.03 MPa, dependent on the condition of the engine. In order to reduce the cost of conversion, direct feed into the carburetor was selected, thus avoiding the installation of additional auxiliary parts and requiring no additional changes in the engine compartment.

To ensure good idle characteristics the main jet was fitted with a so-called "flutter valve," which prevents improper induction of air at idle.

The idle and main jets were arranged in such a way as to allow the most economical gas feed. At the same time this arrangement ensures that atomization of the fuel during operation on gasoline is not substantially impaired.

It is possible to switch from gas to gasoline and back while driving. The unit can be laid out with the option of either magnetic valves or manual shutoff valves.

Icing-up of the pressure reducer does not occur in the pressure range of 2.5 MPa. GDR norms establish the quality parameters for GAS (natural and coal gas) so that the requirements of Technical Inspection are met in this range at the dewpoint ( $-7^{\circ}\text{C}$ ).

The dreaded "manifestations of tension crack corrosion" in the pressure bottles, which occurs at higher pressure ranges, is totally avoided in the pressure range up to 2.5 MPa and if St 38 b (non-heated treated steel) is selected.

The installation is manufactured from domestic materials. The choice of engines and materials permits a high degree of standardization and/or common manufacture, with significant advantages for supplying spare parts, in-house repair and mass production assembly. Crucial components (e.g. the engine regulator)--to the extent that they cannot be taken from mass production and adapted--manufactured in rationalization plants belonging to the energy industry itself. The protective quality of the products is guaranteed.

#### 4. Description of the Driving and Refueling Systems

The design of the 2.5 MPa version is based on the fact that an interconnected regional high-pressure network for imported natural gas is available over the greater part of the GDR, with a maximum operating pressure of 2.5 MPa. The interfaces between this network and the freeways make it possible to build up a system of refueling points.

The so-called supraregional interlinking network, whose maximum operating pressure is 5 MPa, is superimposed on this network as well. Consequently, refueling of vehicles at pressures between 1.5 MPa and 2.5 MPa can be carried out without any problem in the form of direct refueling through so-called refueling points at a large number of supply locations.

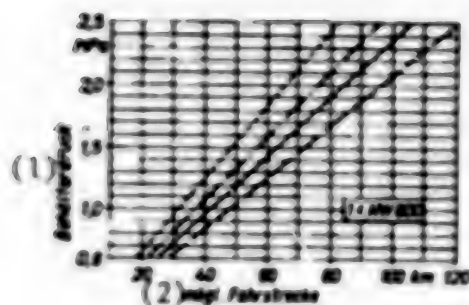
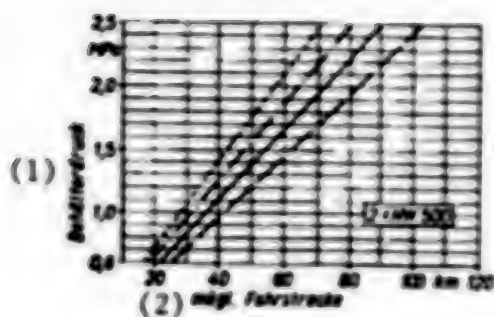
A cost analysis showed that this refueling system can be constructed with relatively low investment costs compared with the version using high-pressure compressor installations, and that a return time on the investment for converting the vehicles and construction of the refueling points of about 2 and 1/2 to 3 years. The vehicles' performance characteristics is dependent on the pre-pressure in the pipeline at the refueling point, as shown in figures 2 and 3.

The driving distance of less than 80 km/day for more than 80 percent of all commercial vehicles involved and the short distance of the refueling points from one another, less than 60 kms, make it possible to set up the design of the driving, refueling and operating system.

In practice the individual refueling points will be constructed in sequence to correspond to the break-in curve of the converted vehicles, that is to say, as they come onto the road, and depending on their home base. At the present time the system is being supplemented so that point-to-point traffic between some district cities is possible without switching to gasoline. With pre-pressures of more than 2.5 MPa a pressure regulator with a quick-shutoff is integral. The time for complete refueling is between 5 and 6 minutes. Currently 8 to 12 vehicles are refueling at each point.

Following the planned conversion of diesel vehicles higher capacities up to 30 vehicles per refueling point are anticipated. At the moment three versions of both vehicle models LO 3000/2500 from the VEB Robur in Zittau have been converted and put into service.





Figures 2 and 3. Dependence of Range on Prepressure and Specific Fuel Consumption

Key:

1. Container pressure

2. Possible range

Legend - - - - - 32 liters/100 kms (gasoline)  
 - . - . - 28 liters/100 kms (gasoline)  
 - - - - - 25 liters/100 kms (gasoline)  
 - - - - - 22 liters/100 kms (gasoline)

### 5. Continuation of the Program and Other Possible Uses

Figures 5 and 6 show the standard vehicle models used in the energy industry. The basic observation can be made that the propellant gas system selected can also be used for coal gas and/or secondary gases from petroleum. Positive results from tests are available, and secondary gas is presently coming into practical use in the northern area of the GDR.

Based on the specific requirements of the energy industry, the results were transposed to other gasoline engines, in particular the models GAS 69 and SIL. With the GAS 69 the containers are accommodated on a trailer, as shown in figure 7. Depending on the terrain the operating range is about 150 to 160 kms.

With the SIL version, a dual installation had to be opted for because of its higher specific consumption (fig. 8).

The version "conversion of diesel engine W 50 by means of the ignition-ray process" was developed for the energy industry area. The experimental vehicle began test operation in February 1984. In the time since then this version has been optimized and tested by the engine manufacturer on the test stand with outstanding results. In collaboration with the Institute for Energy Supply a combine in transportation has developed a version for converting Ikarus buses and started testing.

All the parts in the installation employed for gasoline engines are utilized. Basically the air-gas enrichment is carried out by means of a mixing device in the intake manifold, and the amount to be ignited is determined at the fuel metering pump by means of a manual adjustment operated by the driver. In continuing the program there are plans to transfer the results to stationary engines and to the utilization of biogas or sewage gas.

## 6. Theoretical Aspects and Previous Operating Results

During operation on gasoline about 3.3 MJ (800 kcal) per  $\text{m}^3$  of inducted air are mixed in the carburetor of a gasoline engine to obtain an optimal degree of filling. Assuming that the mixing (atomization) of the fuel with air is achieved optimally, combustion reaches an extreme value based on this optimal oxygen-gasoline-gas mixture and the speed of ignition defined by it. This extreme value determines the power output of the engine. Theoretical formulations, which could be derived from the operation of engines using propellant gas in earlier years, have been confirmed in practice.

It can be established that the engine's behavior in producing power is essentially dependent on its degree of charge. The degree of charge is determined by the caloric value of the gas and/or its percentage of inert gases. The relationships can be seen in Table 2.

Table 2

Type of gas	Caloric value in MJ/ $\text{m}^3$ in standard condition	$\text{m}^3$ in standard condition relative to 800 kcal		
		Air	Gas	Gas-Air-Mixture
Liquid gas	96.1	0.777	0.035	0.812
Natural gas	36.3	0.788	0.092	0.880
Coal gas	15.4	0.828	0.217	1.045

The reference figure of about 3.3 MJ (800 kcal) per  $\text{m}^3$  (in standard condition) of inducted air has proven to be correct. The gas feed should be metered or the engine's power output should be optimized in accordance with the theoretical air factor  $\lambda$  of the gas. Optimization depends on the ignition velocity of the type of gas and peripheral conditions (for example, preignition and ignition spark temperature).

Carburetor geometry and setting as well as the type of jetting influence the mixing effect.

If convertibility to operation on gasoline is set as a requirement as part of the conversion to operation on gas

--no fundamental changes in the geometry of the carburetor and the gasoline jetting system and

--no adverse effects on the air intake  
can be permitted.

On the test stand figures of 92 to 94 percent were achieved during operation on gas, compared with the previous rated output of the engine when operating on gasoline. The vehicle operators' practical experience indicates that there is scarcely any detectable loss in performance. This can be clearly attributed to the fact that in most cases the vehicles are not operated with a full load or with full demands on their performance, i.e. full rated power is required only rarely.

Exhaust performance--particularly with respect to the CO test--has improved unambiguously, which was anticipated as a positive secondary phenomenon on the basis of international experience. It is a necessary result of the fact that, during operation on gasoline, a slight enrichment of the gas-air mixture with gasoline is normal in order to achieve combustion, and the overrich charge does not burn completely, while CO is created.

In previous operating practice it has not been possible to determine whether changes are necessary in the ignition advance or retard as a result of changes in the ignition speeds of the gas-air mixture. Only the heat value of the spark plugs selected was increased. It is naturally assumed that the entire vehicle will be checked for trouble-free operation on gasoline before the conversion is carried out. The principle holds good that if any malfunctions are suspected in the propellant gas installation, a thorough examination is made with the switch to gasoline operation to determine whether there is a fault in the gas installation or a basic malfunction in the engine.

After 1 year of operation it can be said that the objectives established were attained in technology and economy, and the conversion personnel, and above all the drivers of the gas vehicles, became familiar with and/or mastered them surprisingly quickly.

## 7. Concluding Remarks

The version chosen has proved itself to be economical and has stood the test technically. Following a training program, the technical personnel were trained in special courses in collaboration with state offices and an engineering school, and the drivers were trained at the academies of the combines.

The form and scale of the system of driving and refuelling are modified to suit local conditions by means of plant and/or regional objectives and further expanded. For example, refuelling points are being built which, at pressures of less than 1.0 MPa, generate a prepressure of up to 2.5 MPa in a buffer storage tank through secondary compression and thus ensure filling the tanks at 2.5 MPa.

Keeping the demands of the national economy and management considerations in mind, the program will continue towards its objective in 1985 and it is attracting increasing interest outside the GDR.

9581  
CSO: 2300/533

GERMAN DEMOCRATIC REPUBLIC

INTERFLUG PASSENGER VOLUME, OPERATIONAL COSTS DETAILED

East Berlin TECHNISCH-OEKONOMISCHE INFORMATION DER ZIVILEN LUFTFAHRT in  
German vol 21 No 5 1985 (signed to press 31 Jul 85) pp 177-180, 187

[ Article by Eberhard Lein, original title: "On the contribution of the  
Airports operation to the profitability of INTERFLUG" ].

[Text] Tasks of the Airports Operation in the Interflug Aviation Enterprise.

Within the division-of-labor framework of INTERFLUG processes, the airports operation is responsible, in addition to commercial check-in of passengers, freight, mail and baggage handling and the technical clearance of aircraft, for numerous other tasks, whose continuing exact completion is a necessary prerequisite for operation of air traffic and of production processes.

Especially the methodical continuous maintenance and upkeep of runways and operational areas is indispensable for assurance of high air traffic safety and takes up a considerable part of the airport's operational capacity. In this connection the well organized winter service of the GDR airports must also be mentioned because their precise functioning determines the operational readiness of airports during the winter season.

The variety and value of installed fixed assets, such as buildings, building installations, equipments and systems requires utilization of all construction and repair capabilities for their continuous control, maintenance and upkeep. As part of the division of labor in the INTERFLUG enterprise, the airports operation is responsible for maintenance of all buildings and building installations. A further, considerable part of the installed production and work force capacity is committed to the regular control and repair of the comprehensive ground and special purpose systems, especially those for aircraft clearance. The airports operation is also responsible for the orderly functioning of airport lighting and for electric power supply of other operations and installations. Supply of heat in Berlin-Schoenefeld is also assured by the airports operation.

Maintenance of parking areas, services of various kinds, and maintenance of cleanliness and order in public and non-public airport areas are further tasks which characterize the spectrum of tasks which are carried out by the airports operation.

A considerable part of the fixed assets of airports belong to the material-technological territorial structure, which is financed from the government budget and is not subject to private control.

This report gives selected examples of the mode of operations and the achieved effectiveness--related to commercial and technical airport processing.

## 1. Goal Setting for Efficiency Indicators

Comprehensive intensification of the production process is an essential part of economic strategy in order to obtain planned performance increases with given material, financial and working-hour resources [1]. Absolute or relative decrease of expenditures of concretized or human work per performance unit is an unerring measure of the achieved result [2]. Increase of work productivity is here of special importance, taking into account the envisioned economic and expected demographic development in the GDR until 1990. The required performance increase must be ensured with an essentially constant work force and with continuous improvement of quality. The required work productivity increase must be obtained primarily by realizing tasks from the Science and Technology Plan, which are derived in a goal oriented manner from the analysis of the reproduction process.

Another essential viewpoint, which characterizes the reached economic effectiveness level, is the cost development; every production must be carried out with a minimum of expenditures and adequate costs and must show a maximum of identifiable output, i.e. concrete results.

A statement of achieved economic effectiveness by citing formal proof of achievement, or under-achievement, of planned figures as function of their specifics, is possible only in a few cases. Effectiveness considerations require application of a differentiated methodology and above all synthetic characteristics, which are derived from the corresponding planning characteristics [3]. This also provides the necessary bases for management decisions.

With increased responsibility of INTERFLUG operations for their production process within the aviation enterprise it also became necessary for the airports operation to prepare a suitable methodology for the analysis of the effectiveness level and its dynamics. Starting with 1981, certain profitability conferences were held by management which were based on quarterly accounting statements. Based on the developed methodology [4, 5] there are now four-place time series available, which show interesting relationships and permit drawing of conclusions for the economic management of the operation.

## 2. Performance Development

Each airport is primarily measured by its check-in and baggage handling performance and by the related aircraft movements.

Development of physical performance between 1981 and 1984 is shown in Figure 1.

While during the past years a partial stagnation of airport performance growth rates could be seen at the international level, annual performance growth rates of GDR airports amounted to up to 12 percent. Clearances during the indicated time interval increased to 122 percent. The decline in aircraft clearances during 1981 was a result of the decision to terminate inland air traffic, because the short distances, compared to land based traffic, did not permit economical operation of air traffic within the borders of the GDR [6].



- Anzahl der abgefertigten Passagiere (1) Number of Processed Passengers
- - - - Anzahl der abgefertigten Flugzeuge (2) Number of Cleared Aircraft
- · - · Passagiere/ Flugzeug (3) Passengers per Aircraft
- ..... Anzahl der Arbeitskräfte (4) Number of Workers

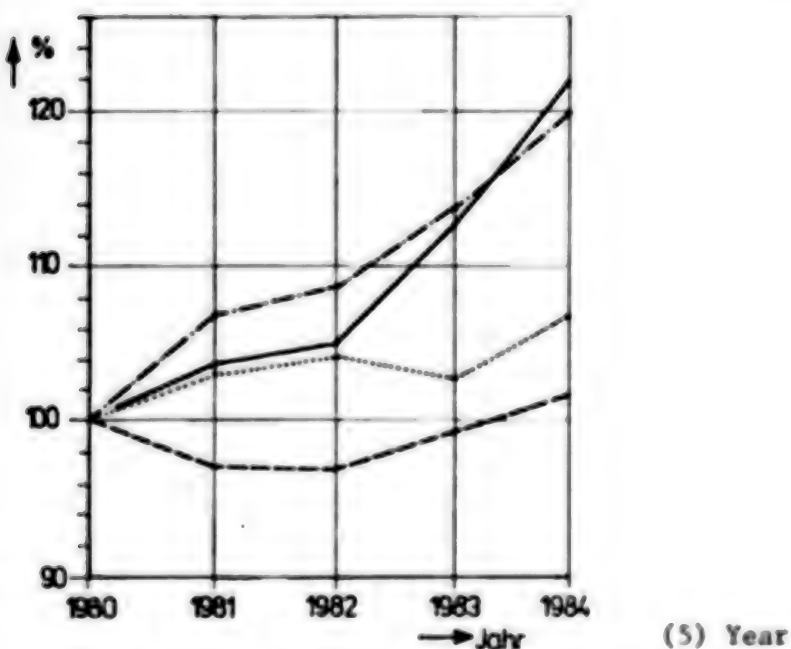


Figure 1 Development of Physical Performance and Number of Personnel  
(1980 = 100 percent)

A clear change in qualitative demands started during 1982, when many airline operators began, under economic pressure of rising fuel prices, to meet increasing passenger demands by utilization of larger aircraft types, maintaining at the same time flight frequencies at the same level. More passengers had to be processed per aircraft, which forced greater demands on the management of check-in and of aircraft clearances.

By introduction of the IL-86 aircraft type "Aerobus", on the friendship line Berlin-Moscow-Berlin, numbers achieved up to then regarding processed passengers and average number of passengers per aircraft were clearly exceeded.

The now daily processing of IL-86 type aircraft and other similar large aircraft types required new check-in technologies, which were solved quickly as part of the Science and Technology Plan as tasks and problems of site planning, conveyor technology, process control, check-in, and baggage and freight handling.

This permitted creation of conditions for technological mastery of the check-in process under increasing requirements with little additional demand for labor.

### 3. Effectiveness of Use of Human Labor

The relatively large increase of manpower during 1983/84 is a direct result of the start of operation of the new check-in facilities at the Berlin-Schoenefeld and Leipzig airports. Creation of new work places, which are occupied in Berlin-Schoenefeld on a continuous three-shift, and in Leipzig on a two-shift basis, required an absolute increase of the number of work places because with this order of magnitude an elimination of work places through rationalization measures alone was not possible.

Despite the addition of labor no negative effects on effectiveness development were noted. In the contrary, it was possible to increase work productivity further and to create favorable relationships in the reproduction process (Figure 2).

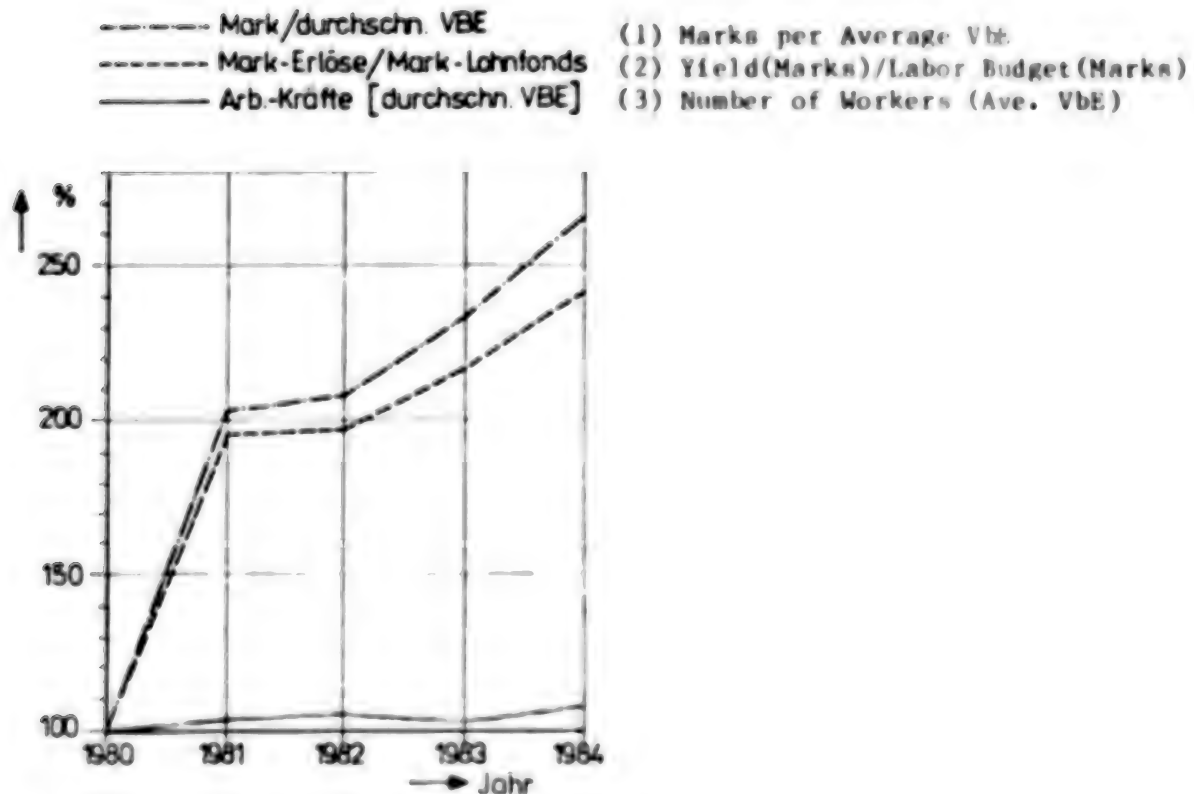


Figure 2 Development of Labor Productivity, of Yield/Labor budget, Labor (1980 = 100 percent)

Although a demonstration of work productivity on the basis of the numerical characteristic expressed by proceeds from goods production (Mark) per "wholly employed" unit (VbE, annual average) is without doubt somewhat problematical, analysis of the time series clearly shows a positive tendency towards intensification of the reproductive process. The above proportional increase of development of specific proceeds, (proceeds in Marks per annual average VbE), for the year 1981 is the result of an internal change in proceeds accounting of the INTERFLUG enterprise in the framework of the intra-company economic accounting scheme based on realization of proceeds. Demonstrated development of proceeds for the following years is directly related to the shown increase of check-in activities, since the level of proceeds from goods production is primarily determined by realized passenger charges, starting and landing fees, and clearance fees.

If the proceeds are related to the labor budget (proceeds (Marks)/Labor budget (Marks)), it becomes clear that increasing proceeds from airport services have been achieved with the available labor budget. Continuous refinement of the performance measurement system for third air traffic enterprises and the permanent control of correctness of accounting methods have been major contributions to the positive development of economic effectiveness of the airports operation. The obtained rates of increase compared with the low index of labor growth are remarkable.

#### 4. Development of Specific Costs

Continuous improvement of the cost-benefit ratio and the positive result thus produced express the achieved effectiveness. Starting with 1981, costs were reported and analyzed as directly related to the financial clearance performance. The clearance unit (AE) was selected as measure of the clearance activities. One AE is the sum of cleared passengers  $\times 0.075(t)$ ; plus freight, mail and baggage(t). A corresponding development is shown in figure 3.

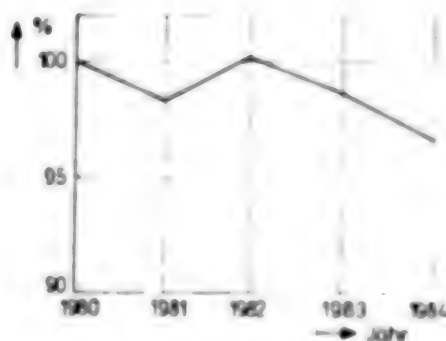


Figure 3 Development of Costs per Clearance Unit (AE) at Berlin-Schoenefeld Airport (1980 = 100 percent)

Despite of intervening price adjustments, which affect direct comparability with the base year 1980, it is noted that the specific costs (costs per AE) have decreased, both absolutely and relatively. This development is

primarily caused by the evident check-in performance, while funding has at the same time decreased. In this case too, science and technology were utilized as productive forces. A diversity of technical-organizational measures permitted reduction of absolute and relative working hours, changes in work organization, matching of technologies to requirements, use of locally developed rationalization methods, and improvements in process control. Last, but not least, the achieved cost reduction is due to practically effective results of innovator's suggestions and agreements and to problems solved by MMH projects (Assembly of Masters of Tomorrow) and youth research projects.

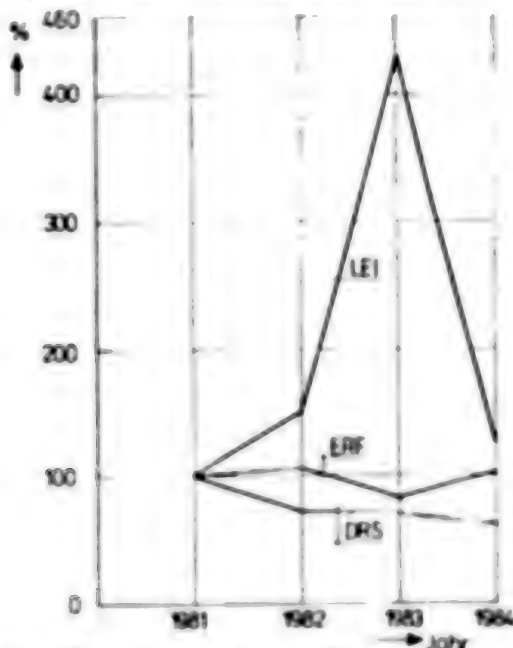


Figure 4 Development Costs per Clearance Unit (AE) at Dresden, Leipzig and Erfurt airports (1981 = 100 percent)

### 5. Effectiveness of Fixed Asset Utilization

Maximum utilization of available fixed assets and of the related available annual capacity is of great importance for the effective formation of the reproduction process. By exploiting additional possibilities for a more intensive utilization of the existing check-in capacity it was possible to take care of the increased passenger load and the--since 1982 occurring--increased aircraft movements, while keeping the costs of commercial and technical clearances at the same level.

Figure 4 shows the development of specific clearance costs (cost per clearance unit) when the available capacity is not, or, for a variety of reasons, cannot be fully utilized, keeping costs equal: the clearance capacity of the Dresden airport was fully utilized in recent years. The high concentration of people in the area serviced by the airport and the importance of this area as an industrial and tourist area, especially of Dresden being a scientific and cultural center, were major reasons for establishing additional air routes to other socialist countries. Since up to a certain service level a great part of the costs remain constant, a more active inclusion of the Dresden airport into the international

point-to-point air traffic caused a positive development of costs per clearance unit. The projected airport capacity was reached in 1983.

In order to carry out the 1983 reconstruction of the starting and landing runways of the Leipzig airport it was necessary to close the airport for certain periods and to transfer clearance activities to the Dresden and Erfurt airports. The resulting costs are shown in figure 4. Related to this is the positive cost development of the Erfurt airport which is a result of its acceptance of Leipzig airport services. This comparison shows clearly that the Leipzig and Erfurt airports represent both a capacity reserve, and that they also are of importance for the further development of the economic effectiveness of the airports operation.

#### 6. Development of Cost Recovery and Profitability

In connection with consideration of specific costs per service unit, an analysis of cost recovery development of the airports operation is informative (Figure 5).

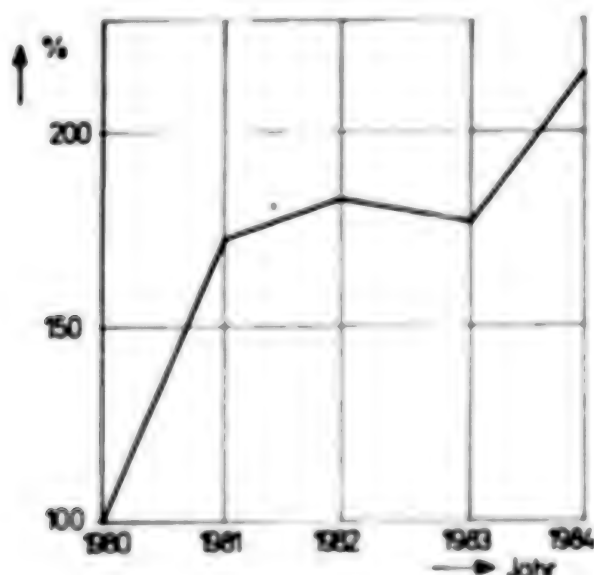


Figure 5 Development of Cost Recovery (1980 = 100 percent)

The noticeable improvement of cost recovery in 1981, as compared to the previous year, is directly related to the already mentioned change in yield accounting within INTERFLUG. This measure created an economically correct relationship between process, arising costs, and realized yields; thus better foundations for profitability studies were created.

Based on this, a system of strong controls of the reproduction process economics was set up in the airports operation; the results are clearly visible in the 1984 cost recovery. Using these results, management is now concentrating all efforts on stabilization of this positive cost recovery development, and on its further improvement.



## 7. Effectiveness of Use of Energy Resources

Reduction of use of energy resources of all kinds is a primary management task, considering concrete economic conditions in the GDR and international developments, especially price developments. Good results were obtained in the airports operation during the past few years in this field too. Practically useful results for improvement of energy economy were presented each year. From these results, the effect of scientific-technical work, an example is selected which deals with the development of specific energy utilization (use of gasoline and diesel fuel per cleared aircraft) at the Berlin-Schoenefeld airport (Figure 6).

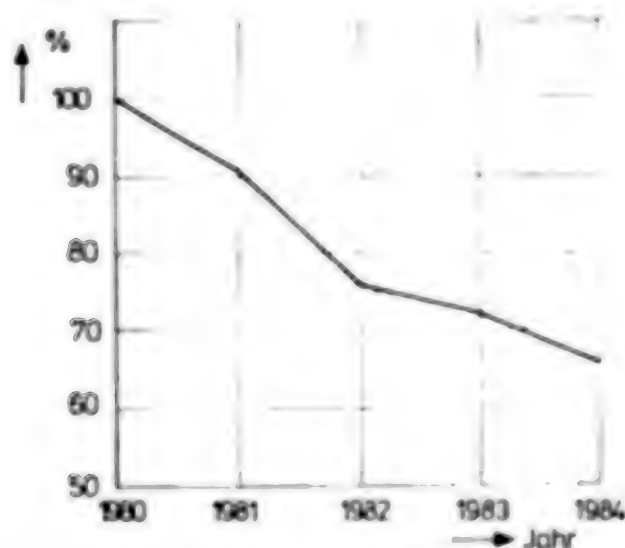


Figure 6 Fuel Consumption (Gasoline plus Diesel) per Cleared Aircraft at Berlin-Schoenefeld Airport (1980 = 100 percent)

Considering the head-in position of aircraft in the first row in front of the terminal building of the Berlin-Schoenefeld airport, heavy tractors are required to push aircraft out into the starting runway, which cause a corresponding fuel demand, and similarly the required special purpose maintenance vehicles require a certain amount of fuel, where all of these requirements are considered as given. Several measures have been taken during the past years which have reduced fuel consumption per aircraft. Results of scientific work have been successfully put to practical use: reduction of specific fuel consumption to 66.1 percent in 1984, relative to the base value of 1980, is an eloquent expression of that fact. One limitation must be mentioned in discussing the 1984 values, however, namely that the mild winter of 1983/84 had a favorable effect. Nevertheless this minimum value will also be used as a progressive goal for the following years.

## 8. Further Development of Efficiency Indicators

The methodology used in the airports operation to solve these problems, and the nomenclature of characteristics which has been confirmed by

management, has proven itself and forms the basis for management decisions for continuing qualification of the management of airport processes.

The quarterly preparation of these effectiveness analyses permits rapid determination of efficiency and its dynamics, which allows sound bases for initiation of needed measures if deviations from the planned data are noticed. Efforts required for these analyses are considerable, however, and are relatively high, considering available technical means and presently used in-house economic accounting methods.

For this reason planned collaboration in the creation of the automated management system for the JADRO reproduction process is of importance for further qualification of the in-house economic accounting and effectiveness analyses.

Starting with the reproduction conditions of the airports operation within the INTERFLUG organization, further development of the whole cost accounting methodology, specifically considering cost units, complete order accounting and gross wages, forms an absolute focal point.

Considering the achieved high state of development of the productive forces, it is absolutely necessary that economic management methods for airport processes are matched to this level.

#### Bibliography

1. Directive of Tenth Party Congress of the SED for the Five Year Plan for the Development of the Economy of the GDR during the Years 1981 to 1985, Berlin Dietz Verlag 1981.
2. 10th Congress of the Central Committee of the SED 20/21 June 1985  
From the Report of the Politburo to the Tenth Congress (Reporter: J. Herrmann), Neues Deutschland, 21 Jun 1985, p 6 ff.
3. Hudewenz, G. System of Characteristics for Effectiveness Measurement in INTERFLUG, TIZL, Vol 18 (1982), No. 6, pp 219 - 221.
4. Lein/ Schuster: Requirements for Conducting Profitability Analyses to Improve Quality of Management and Planning; TIZL, Vol 17 (1981), No. 3 pp 130, 132, 151.
5. Reipert, F. Conducting of Transport Accounting , DDR Verkehr [ GDR Traffic], Vol. 16 (1983), No 12, pp 354-358.
6. Grenzdoerfer, J. Analysis of Air Traffic in a Unified Socialist Transport System of the German Democratic Republic (1961/62), Dissertation A, Friedrich List Transport University, 1964.

INDUSTRIAL EMISSIONS CAUSE LARGE-SCALE DAMAGE TO FORESTS

East Berlin SPEKTRUM in German Vol 16 No 6, 1985 pp 11-13

[Article by Prof Dr Horst Paucke, Institute for Sociology and Social Policy:  
"The Forest: A Vulnerable Ecosystem"]

[Text] Forests have existed for millions of years, helping to shape the appearance of our planet. The macroclimate affects the forests, and they in turn influence climatic, physiographical and edaphic relations. This constant reciprocity brings about evolutionary developments which have caused the variety, abundance and distribution of forests on our earth.

Man is intervening more and more in this development. According to statements made by Soviet scientists A. P. Vinogradov and E. K. Fyedorov, in the past 500 years man has destroyed about 66 percent of all of earth's forests and he is presently going about reducing the size of those that are left. If in 1960, one-fourth of the land surface of earth was still covered by forests, in the year 2,000 forested areas will be likely to have shrunk to 17 percent, and in approximately 30 years, according to the USA report "Global 2000" the figure will be about 14 percent. According to studies carried out by the UN within the framework of the Global Environment Monitoring System (GEMS) of 1980, the results of the world forest inventories of the FAO for 1947-1963 were updated. According to these figures, in 1980 there were over 2.6 billion hectares of "closed" and about 1.2 billion hectares of "open" forests worldwide. The latter designation pertains to zones in a transitional stage to treeless forms of vegetation. This process of de-forestation is certainly being carried out at the present time at a precipitous pace, and it is concentrated above all in the tropical forest areas of Latin America, Africa and Asia. According to 1981 statistics from the FAO, in these areas more than 11 million hectares of tropical forests are cut down each year. The forests are even burned, at times, in order to obtain agricultural lands, pastures, firewood and also lumber. If this trend continues unabated, UN experts estimate that in 80 years at the latest, the tropical forests will have completely disappeared. Even today, it is clear that the results of the exploitation of the tropical forests are having an extremely negative impact. The soil is becoming degraded, eroded and arid in those areas where it is not managed according to scientific principles. Shifting cultivation in particular presents a serious threat to the tropical rain forests, which are scarcely able to regenerate themselves after the trees have been cut down or

burned. And even if this were possible, under certain circumstances it could take thousands of years before the forests were once again halfway able to compensate for the large-scale destruction. For no forest can grow without soil, and the formation of a layer of soil just 1 c. thick requires, according to local geological and climatic conditions, 100-400 years, and often even longer.

### Soil Erosion

In view of this kind of irrational soil management, the forest soil can only be used for short-term agricultural purposes. This type of soil management is therefore ill-suited for meeting the increasing demand for food production in the long run. This is especially true, since according to statistics, not only forested areas, but also agricultural areas are decreasing in absolute terms world-wide, while the deserts are presently increasing by 7 million hectares each year. Such ecological regression is the result of human intervention in the natural equilibrium by commercial measures which do not correspond to the ecological conditions of arid and semi-arid regions. Negative ecological changes in vegetation, soil and the water table reduce the yield of biomass, lower the soil's ability to absorb water and set the stage for soil erosion. The complex organization of the tropical rain forests reacts sensitively and regressively to disturbances because the individual species which constitute it are highly specialized, lack much plasticity, and are therefore able only with difficulty to cope with sudden additional encroachment. Once this kind of tendency has first become evident, it is very difficult to check it or to stop it. Today, one-fourth of earth's land surface has been destroyed by erosion, with another 40 percent severely threatened. Along with the forests, an inexhaustible, constantly renewed source of raw materials is being destroyed, something that is particularly senseless at a time when the world-wide demand for raw materials is increasing and the non-renewable reserves of raw materials are gradually being depleted.

### Increase in Biomass

According to estimates, earth's forests contain approximately 1012 t of biomass, which corresponds to about 80 percent of the phytomass on land; more than 510 t are annually added to this figure by natural growth. This annual increase in biomass in the forests alone surpasses the total present extraction of coal, oil and natural gas in the world by 500 percent. It makes economic sense, therefore, to use the valuable natural resource of the forests sparingly. Furthermore, de-forestation on a grand scale worsens the ecological conditions of life for the people who live in the affected areas. For the flooding that occurs during rainy periods and the water shortages that occur during periods of drought inevitably result from the destabilization of the circulation systems for water and nutrients, both of which have assumed catastrophic dimensions during the past decade. And finally, de-forestation is not without consequences in terms of climate and the existence of various species of plant and animal life.

The causes of the destruction of the forests in the developing countries are above all socio-economic in nature, and in general are due to economic backwardness, particularly with regard to the related institutionally obsolete

forestry management practices that date back to colonial times. At the present time, the problems which must be dealt with can only be resolved by a transition from an extensive to an intensive utilization of the tropical forests, a type of utilization which must be ecologically based, economically determined and planned with the long-range view in mind. This type of management would be suited to bring about the necessary organic link between forest development programs and programs for a subsistence rural economy.

In contrast to the de-forestation that is occurring in the developing countries, forested areas will undergo no significant change in the industrialized developed countries and will stabilize at 1.45 billion hectares. This prognosis, however, does not take into consideration the damage done to the forests that has occurred over recent years, especially in Central Europe. Although this damage has no serious influence for the time being on the total picture, even today it poses very serious problems for the countries affected. For example, according to an analysis of forest damage which was carried out in the FRG in 1984, one-half of the forests in that country is already suffering visible damage. This is damage on a scale that is bound to have severe economic and ecological consequences.

Other Central European countries are more or less severely affected by forest damage as well, nor is there yet any certainty as to the future course that this damage may take. This damage, unlike the situation that exists in the tropical forests, is not due to over-utilization and exploitation of the forests, but in the final analysis the damage can have the same effects, since, particularly in climatically extreme situations, de-forestation can also cause soil degradation which has a negative impact on nutrient and water content. In the GDR, for example, large-scale damage to the forests has caused a steady increase in those areas already exposed to high levels of industrial emissions, e.g. in the upper Erzgebirge, and has necessitated the replacement of the formerly autochthonous stands of spruce by alternate species of trees. These measures have made it possible to preserve the role of the forests in environmental ecology and to prevent or to limit additional damage. The damage that has occurred over recent years no longer permitted the cultivation of spruce trees, as these trees were no longer able to survive in the high altitude areas of the Erzgebirge. Spruce proved to be extremely vulnerable to the emission of industrial pollutants. The resulting thinning of the forests led to a weakening of the protection of younger trees, the rapid spread of grasses and an increase in soil acidity. Under these conditions, it became increasingly difficult to renew the forest even by the use of alternate tree species.

More than 20 years of experience in forestry management under conditions of emissions have shown until now that for replanting, it is necessary not only to select a suitable type of tree and a method of cultivation appropriate to the particular locale, but in addition, high demands must be placed on cultivation technologies, the quality of seedlings as well as on the care of young trees, especially in view of the fact that the use of herbicides in areas damaged by emissions has been almost totally ineffective. In the years to come, plans call for the increased cultivation in damaged areas of especially red beech, mountain-ash and larch, which, with other types of trees



as well, will completely change the character of the forests in the upper Erzgebirge.

#### Smoke-Resistant Tree Varieties

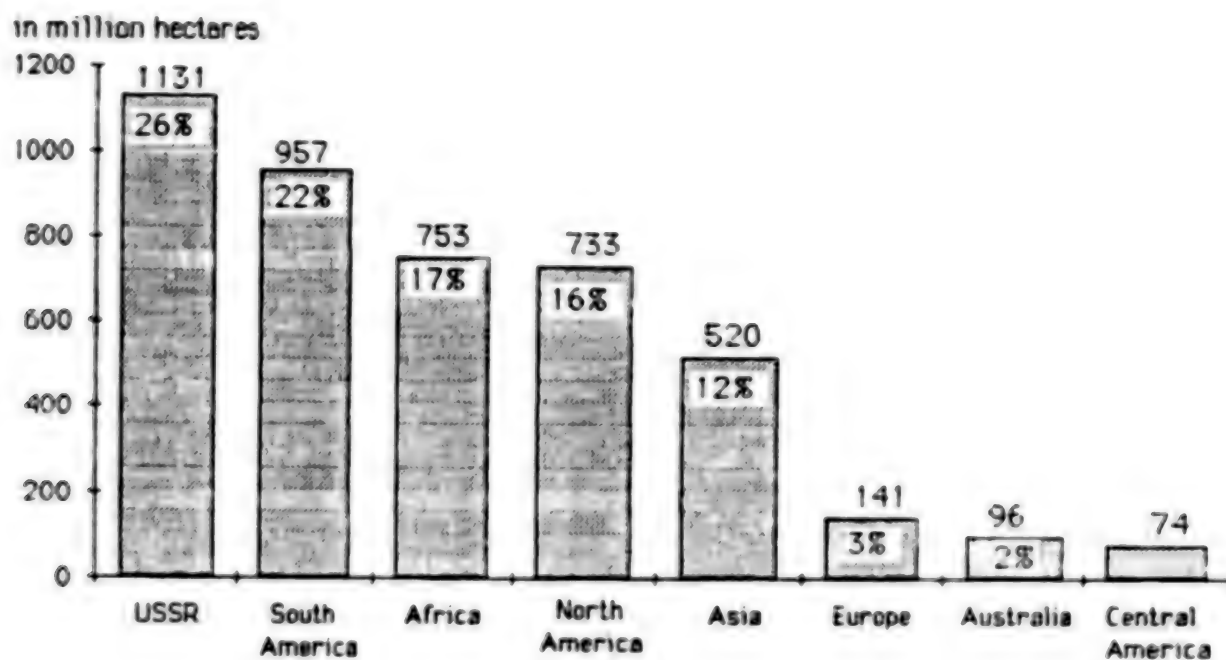
Of particular importance, therefore, are those measures passed by the Politburo of the Central Committee of the SED and the Council of Ministers of the GDR in 1983 for the protection of the forests of the GDR. A long-term programme provides for a wide variety of measures in order to preserve and to stabilize the spruce and pine forests that are endangered because of pollution. These measures include increased use of fertilizers, reforestation with smoke-resistant varieties as well as intensive international collaboration in order to reduce or to eliminate air pollutants that cross international borders, or at least to account for them and thereby to avert further spreading of the damage. In the case of the use of "smoke-resistant" varieties, trees are planted that possess greater hardiness with regard to certain air pollutants such as sulphur dioxide and which are thus less vulnerable. There is no such thing as varieties which are absolutely resistant to SO<sub>2</sub>. Nonetheless, particularly in this regard forest nurseries and forestry cultivation are especially challenged to achieve corresponding results which will increase the relative resistance and adaptability of suitable types of trees. These are to a certain extent therapeutic measures of adaptation, in order to better survive the emissions situation. However, no miracles can be expected from such measures. The main focus of attention will therefore remain on permanently lowering or even completely eliminating the emission of industrial pollutants. Scientists are not yet in complete agreement with regard to the cause of this unanticipated and grave damage to the forests. To be sure, in the past there were times during which the "death of the elms," "death of the pines," "death of the firs" and "death of the beech trees" spread internationally and was of special concern to those involved in forestry sciences; the concern shown by scientists and practitioners, however, gradually abated as these symptoms once again disappeared of their own accord. This kind of trend, however, has not been in evidence in the case of the present damage to the forests. Discussion of the factors underlying the damage today focusses on sulphur dioxide, nitric oxide and ozone, as well as on complex environmental pollutants. This time we are most likely dealing with a qualitative difference representing the historic consequences of a quantitative accumulation of anthropogenic environmental pollution. This view is supported by the fact that the damage is spread over such wide areas and that it affects practically all types of trees and topologies. These types of qualitative leaps occur only gradually and, in their initial phases, almost imperceptible. Once the culmination point has been reached and passed, the process progresses very rapidly, causing the inevitable collapse of the ecosystems of the forest. Interference from other abiotic and biotic factors accelerates this process of disintegration. Pure stands of spruce and pine trees of the same age first fall victim to this process, but pronounced damage is also evident in the case of stable, naturally occurring fir forests, e.g. in the Alps.

Regressive man-caused ecological processes that occur in humid areas, however, do not necessarily always have to end with the disintegration of ecosystems, but can also lead to their reverse development. This is characterized by such

ecosystems' reverting in the case of extreme disturbance from a mature stage to a primitive, juvenile stage. In contrast to the mature ecosystem, the juvenile ecosystem is characterized by a high degree of resistance and the ability to regenerate itself, both features being due to the robustness of the pioneer organisms that are characteristic of this stage. It is noteworthy that the reversal from an advanced to a less-developed successive stage seems to be a common reaction on the part of ecosystems to long periods of stress, whether this is caused by natural or by anthropogenic factors. The organic and structural reversibility of living forms in the direction of a lower evolutionary stage on the biosphere is a survival mechanism on the part of the ecosystem in question, for which less developed ecosystems seem to be better suited than are highly organized ecosystems with very specific requirements. The problematic aspect of these processes, especially those caused by human beings, is not so much the regression of certain ecosystems in general, but rather regressions processes which defy human control and whose consequences cannot be foreseen. Disturbances of this type alter the ecological equilibrium. Thanks to their ability to regulate, organize and reproduce themselves, ecosystems are able to adapt to a wide variety of circumstances, even if this is often accompanied by losses in productivity. Regressive developmental processes are always characterized by a series of transitional stages from more complex, highly productive to simpler, less productive ecosystems.

As the succession of stages shows, in natural ecosystems stability has priority over productivity. Man has taken advantage of the fact that homogeneous plant societies with little structure and few varieties are very productive, and he has ignored the vulnerability of monocultures of this type. In the case of managed forests, therefore, more attention must in the future be paid to establishing a certain proportion of successive societies. Good hopes for productive and stable forests are provided by mixing early and mature successive stages with their characteristic exchange of matter and energy. For this reason, the goal of any kind of forestry management to ensure the maximum supply of wood yield value can in the long run only be achieved if efforts are oriented more strongly in the direction of the ecologically-based principle of comprehensive care of present stock as a guideline for decisions related to both forestry and economic management.

Our present knowledge of the behavior of ecosystems, whether in the presence or absence of pollution, is still extremely limited. And we can correctly understand the behavior of forest ecosystems only if we view the forests as the result of the evolutionary process. This process is subject to a far different time frame than that of the scientific-technological revolution. Therefore, it is a question of acquiring deeper insights into the objective laws underlying nature and society, to which also belongs the relationship between knowing nature and mastering nature, with its positive and negative consequences. This goal in the widest sense could be met by a system planned in the GDR for an ecologically-oriented supervision of forest preserves. Finally, measures for restoration of damaged areas and the avoidance of future damage will serve not only the national economy but the population as well, since the forests fulfill economic, ecological and social functions.



Forested areas in the various regions of the world

[Picture Caption] It makes economic sense to deal resourcefully with the natural resource of the forests, since the annual increase in the biomass of the forests surpasses the present total extraction of coal, oil and natural gas by 500 percent.

12792

CSO: 2300/20

CONDITIONS LIMIT PROSPECTS FOR STEEL PRODUCTION TECHNOLOGY

Leipzig GIESSEREITECHNIK in German Vol 31, No 6, Jun 85 pp 171-75

[Article by Ludwig Ruschitzka, Dr. of Eng. and Lecturer, Freiberg School of Mines: "Scientific-technical Innovations in Foundry Processes--Status Quo in the GDR and International Examples"]

[Text] 1. Foreword

One characteristic of our times is the great dynamism of economic development. The entire, increasingly interrelated cycle of science-technology-production-application is discussed here. The task of a socialistic planned economy is the discovery of the causes and direction of this process in order to put it to good use in the interest of society. From this follows the responsibility for prognostic conceptual work at all levels of the economy. The subject of this article is the presentation of a few internationally known innovative processes to facilitate their appropriate consideration for prognostic reflection.

Innovative processes grow out of concrete societal conditions and pursue concrete societal goals. Innovations are therefore dealt with in the following in close connection with future production conditions and production goals.

2. Future Production Conditions

For such a highly industrialized country as the GDR, raw materials, energy and the work force play a decisive role in the production process. The issue of the availability of these three factors is thus of special interest.

Raw materials and energy are currently scarce and expensive on world markets, and that will remain the case for the foreseeable future. This fact is very detrimental to the GDR because raw materials and energy have to be imported in considerable amounts for the metallurgical industry among others (Table 1). For an understanding of this situation, it is appropriate to elucidate its causes.

Table 1. Import Share for Selected Raw Materials and Energy Sources According to [1]

<u>Raw Material/ Energy Source</u>	<u>Import Share in %</u>
Petroleum	100
Natural gas	65
Iron ore	90
Rolled steel	40
Copper	50
Aluminum	60
Zinc	70
Lead	60

Scarcity and rising cost are not attributable to depletion of resources, but rather to the imbalance between demand and production. All serious investigations reveal reserves adequate well into the next century. Sharply rising demand coupled with higher development costs (and price manipulations in the capitalist markets) have reduced availability and raised prices. Raw materials will generally continue to be available as always, although at much higher prices.

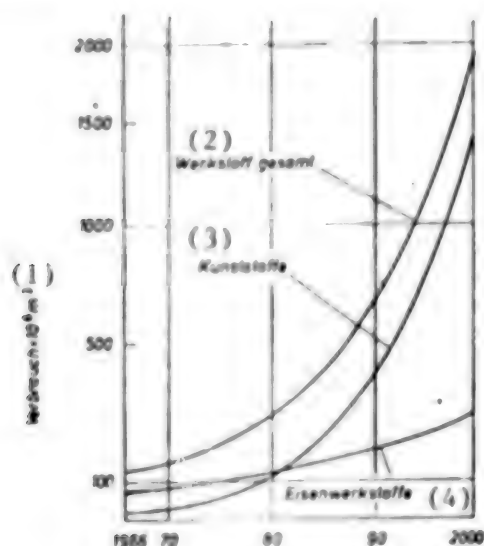


Illustration 1. Evolution of Annual Raw Material Consumption (according to [4])

Key:

1. Consumption =  $10^6 \text{ m}^3$
2. Total raw materials
3. Man-made materials
4. Ferrous raw materials

The rising demand for raw materials and energy is caused by worldwide effort towards industrialization. This process is fed by three driving forces.



First, the industrially highly developed countries are increasing their consumption, although the trend is slowing. Second, the industrially slightly developed countries are striving for a balance of levels and, third, must simultaneously concern themselves with their enormous population growth. The following figures may reveal how much influence the latter factors have: developing countries currently consume 25 percent of the supply of raw materials and energy, although they represent 75 percent of world population, and, between 1980 and 2000, they will show an increase from 3300 million to 5500 million people [2, 3]. Based on this, the worldwide raw material and energy consumption shown in Illustrations 1 and 2 is extrapolated.

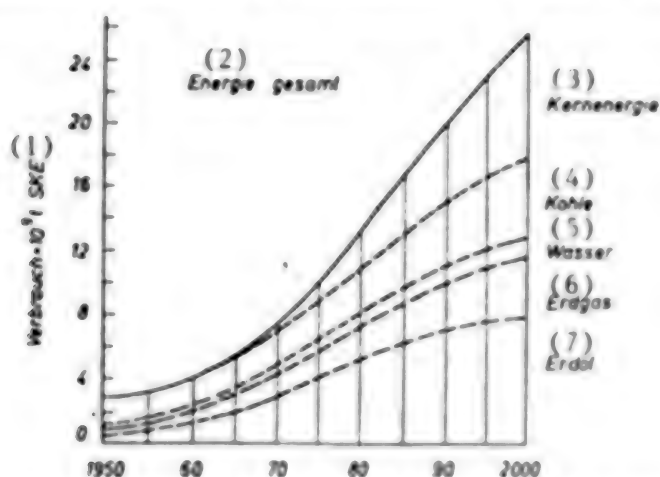


Bild 1. Entwicklung des jährlichen Energieverbrauchs (nach [4])

## Illustration 2. Evolution of Annual Energy Consumption (according to [4])

### Key:

1. Consumption =  $10^9$  t SKE  
[tons hard coal equivalence]
2. Total energy
3. Nuclear energy
4. Coal
5. Water
6. Natural gas
7. Petroleum

The graphics clearly demonstrate that no alleviation of the raw material and energy situation can be expected. The consequences are thus just as clear: Consumption must first be reduced to a technically and economically justifiable amount and secondly be met largely from domestic supplies. The economic strategy for the eighties takes these challenges into account. While the growth rate of industrial net production and goods production which has been averaging 5 to 6 percent annually since 1960 is being maintained, the growth rate of energy sources and raw materials has been declining systematically from 3 to 4 percent annually and will reach a zero level for the first time during the current 5-year plan [5, p. 14].

The evolution of the work force of the society becomes clear from Illustration 3. Starting in 1980, a continuing, long term shrinkage in the potential of the work force must be dealt with. This process is irreversible and will force a real decline in the work force. In spite of the already high qualification structure (58 percent skilled workers, 4 percent master craftsmen, 19 percent university and technical school specialists), because of the continually increasing intensity of innovation and qualifications for products, a further improvement of the quality levels and their full use will be absolutely essential.

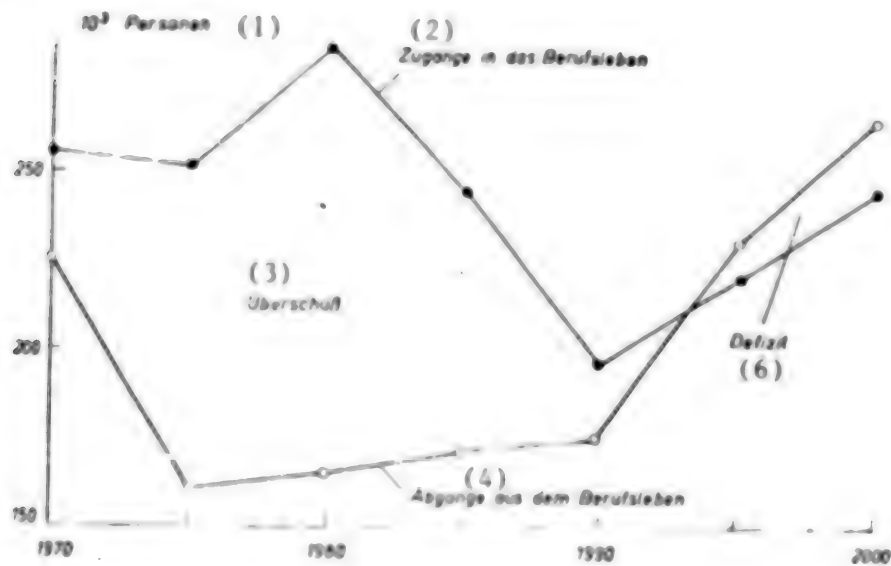


Illustration 3. Evolution of the Work Force in GDR Society  
[5, p. 131]

Key:

1. 10<sup>3</sup> persons
2. Entry into working life
3. Surplus
4. Departure from working life
5. Deficit

3. Developmental Trends for the Production Process in the Future

To adapt to the conditions detailed in the previous section, additional reorganization of steel production must be carried out quickly according to the principles of intensive production. In short, this means:

Intensification of processes;

Refinement of products;

Use or environmental compatibility of waste products and waste heat;

What suggestions are there in the international literature for the fulfillment of these requirements?

### 3.1 Processes

By way of an example, in the smelting operation in Illustration 4 [4], the intensification of a technological subprocess may be seen. The system may be fully automated, but has retained a comprehensive technological flexibility through its electrical mode of heating and its subdivision into three metallurgically active sections (charging, slag smelting, aftertreatment). The production of the entire range of iron-carbon alloys is possible, in which the graduated processing cycle permits a wealth of interventions for achievement of exact technical reproducibility and for performance oriented control. The productivity of the electric furnaces can be fully extended by means of linear arrangement. The smelting operation leads to the programmably controllable integrated production line (IFL), which has been known in molding operations for some time. In this way, the isolated solutions of assembly line production unite to form the automated factory.

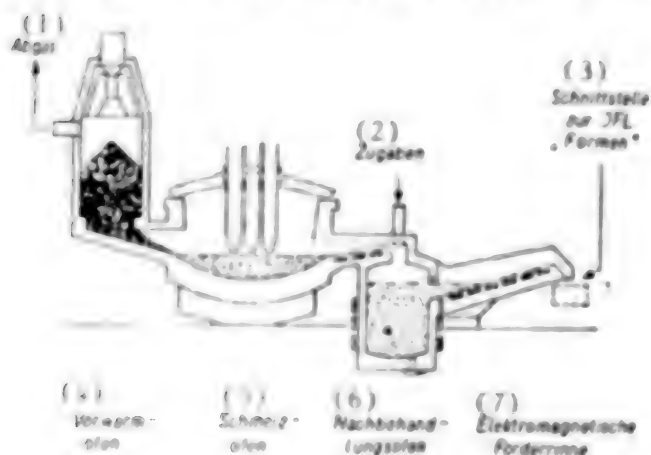


Illustration 4. Integrated Production Line (IFL) "Smelting"  
(according to [4])

Key:

1. Waste gas
2. Additions
3. Interface to IFL shaping
4. Preheating furnace
5. Smelting furnace
6. Aftertreatment furnace
7. Electromagnetic conveyor chute

The following facts should be emphasized in addition to the economic advantages in materials and energy of integrated production line "smelting."

It uses an energy source based on domestic raw materials and smelting ovens with recognized high efficiency levels for energy conversion. A further increase in energy yield is based on preheating the solid charge with heat from the process itself, on the closed, well-insulated type of construction and on uninterrupted continuous operation of the system. A final basic possibility--not included in this system design--for reduction of the energy expenditure consists of liquid metal charging. This so-called liquid connection between the blast furnace and the electric furnace via heat insulated, track-bound ladle cars is already used in some countries for up to 10 percent of pig iron production [6].

Light metal foundries are also supplied with molten metal by means of cars on tracks from central pre-smelters [7]. This most efficient energy rationalization measure for foundries should also be seriously considered in the GDR for suitably located operations. It is also noteworthy from the raw materials economic standpoint that the broad metallurgical interrelational possibilities of the above smelting process allow extensive flexibility in the quality of the charging material.

In conclusion, a few additional comments about work and environmental protection, again presented in Illustration 4. Injuries and pollution are ruled out to a large extent by the exhaust gas free operation and the enclosed construction. Heat generated streams of gas can be drawn into the arc furnace following known processes.

The only problematic aspect of this system is the high sound pressure level, especially in the smelting phase and with the use of the high performance arc furnaces. The only solution is continued reduction of work stations and operation of the system from protected control posts. Both are possible with the current state of the art.

Besides the furnace gases, slag accumulates as a waste product which can be disposed of safely. Of course, noteworthy suggestions [8] have been made for appropriate uses of slag as a secondary raw material. Thus, for example, the use of cupola furnace slag in the silicate industry taps the material and energy value of this raw material and raises the thermal efficiency level of the furnace by 5 percent.

A few basic thoughts have recently been expressed about the concept of the flexible automation typically related to this smelting operation [9]. This idea should not be confused with the motto "Everybody does everything." The economic organizational categories of concentration, specialization and location will not cease to be in effect. In spite of a high technical level of production, flexible automation is intended to give the system appropriate adaptability to client wishes and to technical progress, but within a reasonable overall framework of economic organizational premises.

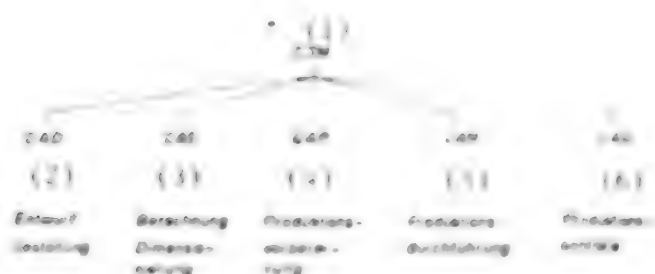


Illustration 5. Overall Concept of Computer Integrated Manufacturing (CIM)

Key:

1. CIM [computer integrated manufacturing]
2. CAD [computer assisted design]: idea, design
3. CAE [computer assisted engineering]: calculation, sizing
4. CAP [computer assisted planning]: production planning
5. CAM [computer assisted manufacture]: implementation
6. CAQ [computer assisted quality]: quality control

The compatibility of automation and flexibility can naturally only be assured when process planned and process directed procedures can be applied with the required speed, precision and linkage. For this purpose, EDP (electronic data processing) has designed an uninterrupted system of information processing techniques which must of necessity be adopted by the foundry industry. Due to space constraints here, reference is only made to the overall concept of computer integrated manufacturing (CIM) (Illustration 5).

### 3.2 Products

The founder will have to be prepared for his products to be judged by stricter standards. This trend is based on the requirements of the purchaser. Engine manufacture, vehicle manufacture, nuclear engineering, turbine manufacture, armature manufacture, etc. are all advancing into new performance ranges under pressure from the production conditions discussed above.

Thus, for example, a further lasting improvement is predicted in the man-performance ratio of automotive diesel engines (Table 2). In general, it is to be stressed that these processes tend toward extreme performance parameters (pressure, temperature, static and dynamic load, corrosion, etc.) with simultaneous reduction of structural dimensions (decreases in raw material input, dead weight, acceleration ratio, etc.).



Table 2. Mass-Performance Ratio of Automotive Diesel Engines  
(according to [10])

Year	Ratio
1960	6 kg/kW
1980	4 kg/kW
2000	3 kg/kW

The task can be illustrated by the criteria of material exploitation and material input (Illustration 6). While exploitation of materials--represented here by the average hardness of all castings--will continue to rise, the input of raw material has to decrease. The combination of all the measures which permit this materials engineering intensification constitutes refinement metallurgy. The increase in exploitation of materials has to be greater than the increase in production in the general growth of the economy.

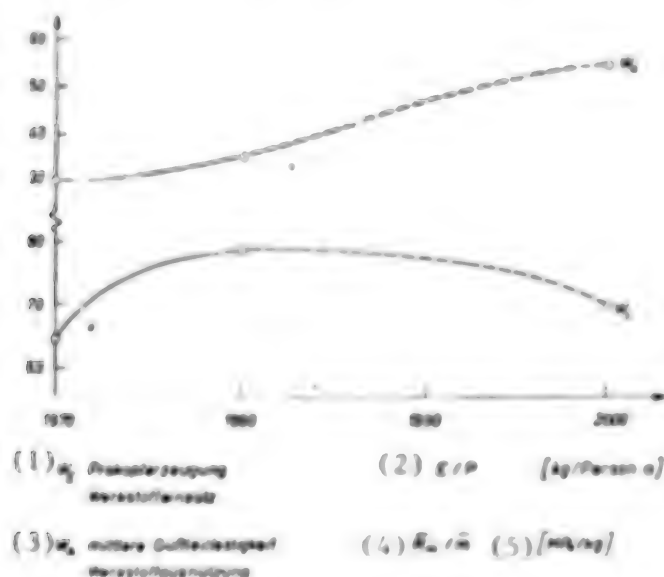


Illustration 6. Evolution of Materially Economic Reference Numbers

Key:

1.  $W_E$  Per capita production  
Material input
2. Input/per person
3.  $W_A$  Average hardness of steel castings  
Material exploitation
4.  $(R_m)$
5.  $([MP_a/kg])$

What international innovations are now discernible in the materials engineering arena?

A few recent developments are shown in Illustration 7 without consideration of their potential range of applications in traditional casting materials. The level of refinement is construed there as the ratio of intellectual input to material input. The refinement of the product increases with increasing intellectual outlay.

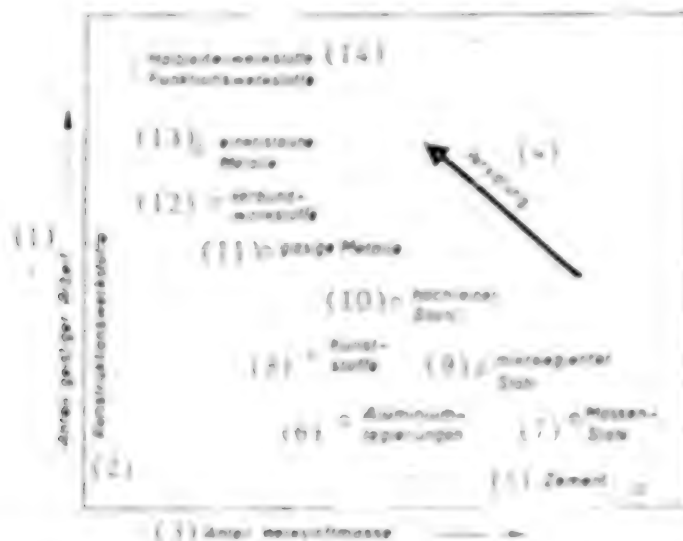


Illustration 7. Refinement Level of Selected Materials, Expressed As Shares of Material and Intellectual Input Per Unit of Value of the Products Manufactured From Them (according to [1])

Key:

- |                               |                             |
|-------------------------------|-----------------------------|
| 1. Share of intellectual work | 8. Man-made materials       |
| 2. Construction materials     | 9. Microalloyed steel       |
| 3. Share of material          | 10. High purity steel       |
| 4. Refinement                 | 11. Amorphous metals        |
| 5. Cement                     | 12. Solid solutions         |
| 6. Aluminum alloys            | 13. Monocrystalline metals  |
| 7. Bulk steel                 | 14. Semiconductor materials |
|                               | Specialized materials       |

Microalloyed and high purity types of cast steel are already on the threshold of international application. Especially valued are their combination of the properties of hardness--toughness--weldability. Microalloyed cast steel attains these properties through reduction of carbon content and reduction of the grain sizes through specific alloying and heat processing techniques. Mo, Nb and V are alloyed at contents of 0.5 percent [12]. With hardnesses of  $R_m = 500\text{N/mm}^2$ , elasticities of  $\Delta\epsilon = 39$  percent are achieved.

High purity steel can no longer bypass secondary metallurgical treatment steps in the vacuum converter. The drastic reduction of the content of P, S and N is possible there expands the combination of properties mentioned above through cold toughness and fatigue strength [1].

The remaining metallic construction materials shown in Illustration 7 are still in the developmental stage and will certainly only be used for special purposes in the near future. Nevertheless, written laboratory conclusions and calculations in input demonstrate the enormous materials engineering potentials which are now to be exploited to the fullest.

Amorphous metals are produced with extremely high rates of cooling from the liquid phase through amorphous solidification. The lack of grain boundaries leads to a high mechanical hardness, exceptional corrosion resistance and to soft magnetic properties [14]. Applications which have become well known are razor blades, transformer materials and permanent magnets.

Special expectations are held for solid solutions. They combine the properties of two metals (e.g., aluminum-steel) or one metal and a nonmetal (e.g., steel-carbon fiber). Illustration 8 shows the microstructure of an aluminum-steel solid solution. For this combination, hardnesses of  $H_n = 1500 \text{ kg/cm}^2$  were predicted [15]. The combination of aluminum-ceramic has already been tested industrially in the development of fuel economizing engines [17]. For thermally insulated combustion chambers, aluminum pistons with integrally cast ceramic (Mulde) have been constructed.

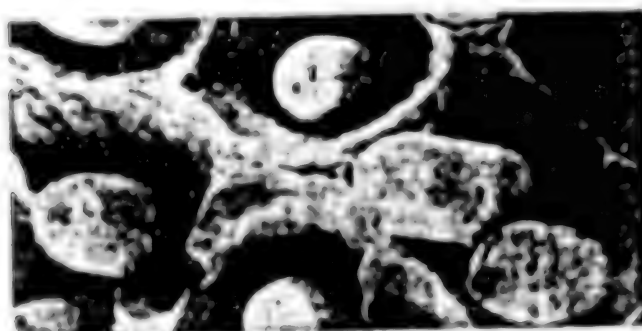


Illustration 8. Electron Microscope Photograph of the Surface of Fracture of an Aluminum Steel (according to [15]).

With controlled temperature-time parameters the solidification of a substance with a disordered crystalline structure may be stamped onto a substance with an ordered crystalline structure to form a monocrystalline substance. Monocrystallines are largely free of lattice defects and therefore possess good mechanical properties and very good corrosion resistance. For a partly austenitic, (martensitic) solidified cast steel alloy, the following astonishing characteristics were reported in the laboratory [18]:

$\sigma_{0.2} = 1700 \text{ kg/cm}^2$ ,  $\sigma_{0.01} = 2000 \text{ kg/cm}^2$ . The original values with (ungrain-refined) solidification were  $\sigma_{0.2} = 1200 \text{ kg/cm}^2$ ,  $\sigma_{0.01} = 1400 \text{ kg/cm}^2$ . The cast austenitic was found suitable even to be the monocrystalline turbine blade root of an F4U-100 by production according to the investment casting process [19].

The distinct advantage of the use of casting is shaping by means of a single processing device. That is the basis of the economic superiority of casting compared with other types of shaping (Table 3). But, from this the responsibility arises for the founder, not only to orient the geometric design of the castings to suit production, but in cooperation with the designer to take appropriateness to purpose into consideration. The casting should bear its load with the least possible input of material and also permit cost-effective production. These conditions can now be fulfilled for many castings only through analytical-computerized methods.

Table 3. Energy Economic and Material Economic Values for Various Production Processes (according to [20])

<u>Process</u>	<u>Energy Expenditure Per Finished Piece [MJ/kg]</u>	<u>Material Exploitation [%]</u>
Sintering	29	95
Casting	30-35	90
Hot Forging	46-49	85
Machining	66-82	40-50

Internationally, the computer techniques mentioned above are being used more and more to accomplish this task. Illustration 9 presents, for example, the plotter printout of a structural frame assembly joint made of cast steel GS-13MnNi6 4. The joint has a mass of 18 tons and is the construction component under the most stress in the truss assembly of drilling platforms [21]. With the help of computer assisted design and engineering methods, geometric optimization was achieved, taking the following factors into consideration:

- Load-appropriate wall thicknesses;
- Prevention of points of strain;
- (gerichtete) solidification;
- Minimal material input.

The software developed by the manufacturer further permits, for every element of the "joint" design family, processing bid and production documents in less than a week.

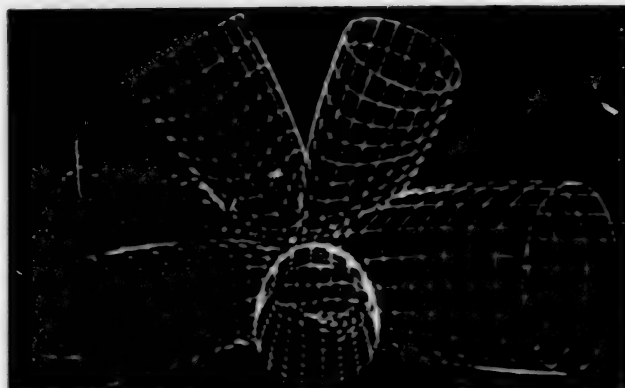


Illustration 9. Joint Element for a Truss Assembly (Plotter Printout)  
(According to [21])

#### 4. Concluding Remarks

The limited selection of foundry engineering innovations presented here demonstrates that these problems are being worked on worldwide. Continuation of innovative development can be derived from integration of scientific-technical innovations with the conditions and goals of the production process. Innovations are not a goal in themselves, but rather the agent of intensification and refinement. The examples given here are meant to be characteristic of the scope and richness of innovation. Support and implementation of innovations is an essential component of any planned technical policy. But, in this regard, formal copies are as a rule not very successful. Innovations achieve their full potential only when they are founded upon the concrete societal environment.

#### FOOTNOTES

1. A. Neumann, "Werkstoffe mit Zukunft" [Materials with a Future], Urania Verlag, Leipzig/Berlin/Jena, 1977.
2. W. Palm, "Rohstoffe im Engpass" [Raw Materials in a Bottleneck], Urania Verlag, Leipzig/Berlin/Jena, 1979.
3. K. Feller and J.A. Masson, "Steel Production as a Partner of Domestic Industry and of International Developmental Activity," Address to the 50th International Steel Producers Congress, Cairo, 1983.
4. H. Britt and K Feller, FOUNDRY TRADE JOURNAL, Vol. 1, 1975, pp. 69-79.
5. "In die Zukunft gedacht" [Thoughts on the Future], Verlag Die Wirtschaft, Berlin, 1983.
6. "Giessereikalendar" [Steel Producers Calendar], 1971.



7. G.L. Armstrong, GIESSEREI-PRAXIS, Vol. 20, 1978, p. 335.
8. F. Kirchner, GIESSEREITECHNIK, Vol. 30, No. 10, 1984, p. 302.
9. L. Ruschitzka, GIESSEREITECHNIK, Vol. 30, No. 9, 1984, p. 267.
10. K.H. Caspers, GIESSEREI-PRAXIS, Vol. 21, 1984, p. 353.
11. D. Altenpohl, Address 7 to the 7th International Light Metal Conference, Leoben, 1981.
12. B. Walser, et al., KONSTRUIEREN UND GIESSEN, Vol. 7, No. 1, 1982, p. 4.
13. P. Tennila, et al., In-house document of Leles Oy Lokomo Division, Tampere, 1983.
14. INDUSTRIEANZEIGER, Vol. 106, No. 56, 1984, p. 61.
15. W. Schatt, SPECTRUM, Vol. 9, No. 3, 1984, p. 28.
16. R. Streicher, Address 1 to the 7th International Light Metal Conference, Leoben, 1981.
17. A. Koewius, ALUMINIUM, Vol. 60, No. 4, 1984, p. 299.
18. B. Marincek, GIESSEREI, Vol. 68, No. 7, 1981, p. 175.
19. K.H. Krekeler, GIESSEREI, Vol. 71, No. 1, 1984, p. 26.
20. N. Goette, INDUSTRIEANZEIGER, Vol. 89/90, 1983, p. 19.
21. F. Gantke, et al., KONSTRUIEREN UND GIESSEN, Vol. 7, No. 2, 1982, p. 4.

12666

CSO: 2300/530

## GERMAN DEMOCRATIC REPUBLIC

### MODERNIZATION SEEN AS MAIN GOAL IN TRANSPORT INDUSTRY

East Berlin DDR-VERKEHR in German Vol 18 No 9, Sep 85 pp 259-61

[Address by Otto Arndt, Minister for Transportation: "The Tasks for Transport in the Second Half of the 1980's"]

[Text] At the third comprehensive congress on transportation, which was held as a joint meeting of the Associate of Vehicle Constructors and Transportation of the Chamber of Technology and the Central Research Institute of GDR Transport on 9 and 10 April on the topic "Computer-Aided Control of Vehicle Use--A Fundamental Contribution to the Intensification of Transport Processes in the National Economy," Otto Arndt, member of the Central Committee of the SED and minister for transportation, delivered the keynote address, outlining the tasks for transport in the second half of the 1980's. The following editorial version goes into greater detail about those statements by the minister in which he discussed the results obtained so far in the application of microtechnology and its future areas of use in GDR transport in accordance with the base-lines of transportation policy.

#### Good Results Using Microtechnology

The minister estimated that transport has made a significant step forward since the 10th SED Party Congress with the use of microcomputer technology, and the greatest progress was achieved in redesigning the dispatch processes for the railroad, as the first important area for the application of this new technology.

The initial installation of microcomputer-controlled ticket window printers has been completed nationwide, and the automatic dialog machines have proved themselves in implementing self-service.

New technologies and tangible improvements for air travelers and passengers went into effect with the automatic seat reservation systems for INTERFLUG and the railroad.

The second important area for the use of microtechnology and microcomputer technology was that of energy-efficient driving techniques and the monitoring and management of vehicles in various areas.

Effective means to reduce specific fuel and energy consumption have come into use with the development of governing devices for motor vehicles and on-board computers for the railroad's driving units. In the minister's words, great importance was to be attached to prior developments and the experience gained in monitoring and managing vehicles, taking into account the strategy to utilize means of transport better, particularly as the development of dialog data equipment at the Central Research Institute of GDR Transport (ZFIV) showed clearly that transport is in a position to effect steps for rationalization, based on microelectronics, and demonstrating the highest quality.

In this context Minister Arndt pointed out that, in spite of manifold efforts and initiatives, development was just beginning in the branches of railroad, road transport, inland waterway shipping, and in the combine shipping and port industry, in which extensive experience was gained with the PORT-BILANZ project.

#### Using Past Experience Properly for the Future

The Minister cited three crucial reasons for the positive results achieved so far in using microcomputer technology:

1. It proved possible to combine effectively the basic research on this topic at the College for Transportation Friedrich List in Dresden with the research on practical application at the ZFIV and with the production of the means of rationalization in several railroad plants.
2. In all branches of transport success was achieved in generating capacity at home for the manufacture of means of rationalization, in developing the software and in concentrating funds in important areas to achieve a breakthrough in in selected areas and to create the necessary headstart in others.
3. User communities were successfully created with the help of consultation bases, and the necessary experience provided by means of goal-oriented continuing education.

Minister Arndt characterized prior experience in the development and application of microelectronics as of fundamental importance in raising the economic and social effectiveness of science and technology in our country's transport.

For example, the scope of the manufacture of the means of rationalization has been successfully increased in 1984 by 210 percent in transport, compared with 1980, which has created the fundamental conditions for improved management of the processes of transport, construction and repair.

But Minister Arndt left no doubt that in such crucial areas as

- computer-aided location and management of freight car rolling stock,
- the reduction of specific material and energy consumption,
- the introduction of modern technologies to restore the road network to good condition and to ensure its ability to carry traffic,

- flexible automation to increase performance in the repair and new construction of modes of transport and
- reducing the required work force

It was necessary to increase the pace of development in order to guarantee the development in performance needed in transport.

#### **Intensifying the Processes of Production Leads to Structural Changes in Transport Performance**

Referring to the speech by the member of the Politburo of the SED Central Committee, Dr Guenther Mittag, to the director generals of the combines on 7 March 1985, the speaker pursued the connection that exists between the overall intensification of the economy and the far-reaching structural changes in transport performance that will result from it.

The minister identified determining factors for these structural changes:

1. the growth of bulk freight transportation, resulting from the increased use of domestic raw materials and resources and of methods of transport that are immediately involved in supplying the population and
2. changes in the flow of goods, resulting in part from the concentrated construction activity in the nation's capital, but also from growing foreign trade activity and the heavier use of our own seaports, including the Klaipeda-Mukra ferry link.

#### **Primary Lines of Development for Freight Traffic**

With an eye to the approaching 5-year plan period from 1986-1990, the minister for transportation laid out three primary lines for further work in freight transportation:

Firstly, with volume rising on an absolute basis, specific costs for transport have to be reduced further, with a target of additional rates of reduction between 3 and 4 percent for inland freight traffic.

Secondly, there is to be further comprehensive intensification and modernization of unified socialist transport, in order to keep pace with growing demands on capacity on the one hand and on the other to improve the working and living conditions of the workers in the various branches of transportation.

Thirdly, the basic premise must be that a further rise in the productivity of the railroad remains the core of intensifying and modernizing transportation as a whole, because the railroad has to cope with the major part of the growing demands in passenger and freight transport.

The development of inland freight transport, handling it more efficiently and the reduction of economic costs for transport are determined by four primary lines:

The first consists of:

- optimizing the relationships between supply and transport and putting the next higher stage in effect, optimization of production and transport as a permanent task, with the objective of making transport costs as low as possible;
- speeding up the entire production-transport cycle in an economic sense by using information processing systems, electronic data processing and handling and robot technology;
- increasing the efficiency of transport processes in the national economy by means of a comprehensive analysis of processes and costs and by perfecting planning and economic bookkeeping.

The second consists of further development in rationalizing the transport industry on a comprehensive territorial basis.

The third consists of more intensive utilization of available forms of transport, with better utilization of freight cars forming the main link in this work now and in the future.

The fourth must be seen as the elaboration of new forms of transport, which will require proposing to the economy that they offer the kinds of performance that match the increasing integration of production and transport. In this context, the minister looked for an annual increase in container transportation of between 12 and 15 percent. For selected types of goods the railroad has to develop technologies which will ensure that guarantee that delivery deadlines are met.

Minister Arndt emphatically stressed the necessity of taking decisive action toward perfecting the mechanization and automation of freight processes in the second half of the 1980's, because this can not only increase the efficiency of the processes themselves, but working conditions must also be improved and the labor force situation must be put on a more relaxed footing.

#### Principal Lines of Development for Passenger Traffic

The main objective in passenger traffic is to bring about a turning point with respect to higher quality, as a result of higher quality in the way work is carried out in all areas and by means of the targeted use of science and technology and utilizing available reserves. The primary objectives are to ensure punctual and reliable transportation, reduce travel time, provide better information and efficient dispatch.

In the minister's estimation, taking the development of individual traffic into consideration, the volume of traffic will grow by only about 1 percent per year. The most important area remains the policy of developing new residential and work areas with electrically powered vehicles as the primary methods of transportation. Special attention is being devoted to traffic conditions in the capital. Full dual-track operation of the S-Bahn to Hohenschoenhausen will commence in 1985, and, by the time of Berlin's celebration of its 750th anniversary, the first section of the above-ground extension of the U-Bahn E to Kaulsdorf Hellersdorf will begin operation. The speaker identified an import-



nt objective when he said that the range of services and the attractiveness of long-distance and international travel had to be expanded. As evidence of this he cited the reductions in travel time, which became effective with the 1985-86 schedule, resulting from the electrification of the lines and the gradual increase in the range of travel possibilities, primarily in the form of high-speed connections on heavily traveled lines between district cities.

Tourism by rail is being expanded further in harmony with the material opportunities, while the major concern in road traffic is to bring about a qualitative improvement in traffic organization as a result of better traffic control and monitoring systems and added technical and organizational measures.

The minister identified four comprehensive areas with regard to higher quality in tourist traffic:

1. The development and putting into operation of adequate technologies and mechanisms for cleaning railroad carriages and urban local transport vehicles on the inside and the outside.
2. Continued development of modern service and dispatch systems for passengers. The idea of self-service should be expanded qualitatively to include the purchase of tickets without cash.
3. Development work to be concentrated on an even more productive and efficient design for in-house manufacture of railroad carriages in the Raw (railroad repair yard) in Halberstadt.
4. Increasing the availability of the rolling stock by using modern diagnostic methods and rationalizing maintenance work, including the establishment of modern technological jobs.

#### Modernization is the Principal Way of Renewing Basic Assets

Further on in his speech Minister Arndt described modernization as the principle way of renewing the basic assets of the transport industry. The primary concerns must be to operate the available basic assets--primarily means of transport--as efficiently as possible and at full capacity, to keep them productive by means of active maintenance, to extend their useful life and to modernize with the assistance of general repair. Investment must be concentrated in important areas and made according to a ranking and sequence determined by the needs of the economy. This strategy includes a rapid increase in the scope and quality of maintenance work and the production of means of rationalization.

Explaining the development of the transport network in greater detail, Minister Arndt said that an adequate network of railroad lines, roads and inland waterways already existed as far as its coverage and structure were concerned, it was a matter of eliminating deficiencies and, by modernizing in a targeted way, bringing about a level of efficiency and performance that satisfied the requirements.

## **The Importance of CAD/CAM Technologies for Manufacturing the Means for Rationalization**

The speaker characterized the accelerated development of domestic manufacture of the means of rationalization as a crucial precondition for attaining the requisite higher level in transport, building and repair processes. The minister referred to the request made by Dr Gunether Mittag at the seminar for the director generals regarding even greater speed in introducing automated manufacturing areas, including automated design and preparation for production, and he ventured to say that experience shows the most efficient way to achieve automation based on microelectronics is to develop qualified software.

The conclusion drawn by the minister was to create the conditions needed to boost the production of the means of rationalization and to develop software, besides the continued development of our own scientific-technical potential in all branches of transport.

In the words of the speaker, the transport industry needs automated production lines for the manufacture of its own freight cars and track-laying machines to meet the lofty goals of the coming 5-year plan. The productivity needed for this manufacture can only be achieved through the increased use of robotics technology. Modern conveyor lines are indispensable in new construction, in rebuilding and in maintenance. The requisite extensive design and planning work has to be executed more quickly and made more efficient with the help of CAD/CAM technology.

In this context, Minister Arndt requested that this modern technology for manufacturing preparation should also be used for technological operational planning, for example, designing the railroad's schedule.

In conclusion the speaker said:

"More than ever we need peak performance in the transport industry, performance that clearly matches world standards both in the area of science and technology and in the area of economy. Teamwork, at the plant level and beyond the plant in the socialist engineers organization offers the best conditions for the effective promotion at many levels of the wealth of ideas originating with the scientists, technicians, engineers, economists and innovators and for expanding it purposefully through the appropriate educational measures."

9581

CSO: 2300/6

IMPROVED ECONOMIC ANALYSIS AIDS AGRICULTURAL MANAGEMENT

Managerial Requirements Considered

East Berlin KOOPERATION in German Vol 19 No 6, 1985 pp 241-44

[Article by Bruno Forebe: "Business Management Analyses of Economic Processes-- Contribution to Realization of Our Economic Strategy"]

[Text] Business management analyses are among the most important methods of managerial activity in socialist agricultural enterprises. They make it possible to determine one's own level of performance in comparison with the best, to recognize developmental tendencies in production as well as in efficiency and to show the causes of differences in performance.

The LPG [Agricultural Production Cooperative] of the Cobbelsdorf Cooperative, Rosslau Kreis in the Halle District, had already charged its Cooperative Council in 1976 with regularly analyzing the results achieved through joint effort and the contributions of the individual partners of the cooperative towards self-production. In the process, their own niveau was consistently compared with that of the best of the LPG's and VEG's [State-Owned Farm] operating under similar conditions. Here, they were acting in accordance with their conviction that they would benefit themselves as well as society as a whole and strengthen peace with a rising contribution to supply and the national income.

Today the LPG of the Cobbelsdorf Cooperative is among the strongest performing in our republic (see the cover illustration [not reproduced]). One reason for this is that the cooperative farmers and workers were drawn into the critical analysis and judgment of the achievements of their LPG and of the cooperative. Their sense of initiative was awakened and their willingness to take advantage of all opportunities for increasing production and efficiency, first in their own areas of responsibility, was encouraged. Today this motivates them to analyze the results of their own enterprises with respect to their specific effects and to evaluate them above all with a view towards the best possible utilization of production conditions for maximal achievements by their cooperatives.

These proven methods of Cobbelsdorf should be used more by all LPG committees, VEG directors and cooperative councils in order to be able to recognize the

causes for differences in performance and overcome them through common effort. (See also the contributions to analytical work on pages 241 to 255 of this issue.)

The cooperative farmers and workers of our republic are making great efforts to guarantee the population a supply of nutritious foodstuffs and industry a supply of agricultural raw materials, to the greatest extent possible from native production. Their great economic achievements rest on the realization that they can most effectively contribute to securing peace, strengthening the GDR and improving working and living conditions through industrious labor.

SBW [socialist business management] has to support the initiatives and creativity of the cooperative farmers and workers. To achieve this, methods, principles and rules of business management, which are continually oriented towards and suitable for high levels of production and efficiency and which make the agreement in principle between societal and individual interests clear and obvious right down to the workplace have to be worked out and put into practice. This is to be insured, in particular, through the consistent and comprehensive realization of the socialist principle of achievement. A prerequisite to this is fully recording and evaluating the achievements of the collective and of the individual, the expenditures involved and also the regulations and measures of business management that have led to the results have to be worked out and put into practice.

The insights of the classics of Marxism-Leninism and the decisions of the party and the government are based on exact analyses of economic processes. Analysis as a working principle is applied here primarily along two lines:

--One examines which objective and subjective prerequisites are necessary to consciously utilize the mechanisms of the economic laws of socialism, what state has been reached and which problems must be solved.

--One examines economic facts, developmental tendencies and processes with the goal of finding the causes of phenomena and possibilities for influencing them and so detect reserves.

Economic analyses are frequently used as the means and methods of managerial activity at all levels of socialist agriculture. We differentiate between three components of business-management analysis:

1. Business analysis, i.e. the analysis activity of managers within their areas of responsibility. This is directly oriented towards working out the bases of decision for managerial activity in the business or in divisions and brigades, including regulating competition.
2. Analysis of the effectiveness of individual regulations (e.g., planning guidelines or organizational structures) that can be thematically delimited to within business management.



3. Analysis of the state, developmental tendencies, problems, and possible solution in the implementation of the principles of the SBW in the LPG/VEG's and their cooperatives. Here, the subject of investigation is all the enterprises and cooperatives. Since the effectiveness of the SBW must always be measured in terms of the economic results, the analysis of the state and developmental tendencies of production, efficiency, and of the conditions of production are components of this task. Its content, as a matter of priority, should be oriented towards the needs of the state management as well as towards research and instruction.

#### Analysis Closely Related to Evaluation, Comparison of Performance

In practical business management, analysis, and the evaluation and comparison of performance are closely connected. Not only because they mutually determine and influence each other, but above all because every manager has to use them to judge the state and developmental tendencies of production and efficiency, to recognize reserves and to work out the bases for managerial decisions.

The success of the analysis depends crucially on the ability and willingness of the manager and the members of the collective to pursue the causes right down into their own workplace, to investigate both the effectiveness of managerial activity and the perception of personal and collective responsibility and to derive unambiguous tasks from this. As a rule, the causes for unwarranted differences in the level of performance in divisions and brigades are also to be sought primarily in the differing effectiveness of the managers and the business-management regulations that apply within the enterprise.

The procedural steps that have proven themselves in the preparation, implementation and evaluation of socialist performance comparisons should thus also be maintained in the analysis:

1. establishing indicators for estimating levels of and differences in performance, determining their distances from optimal values and norms, etc. (analysis and evaluation of performance);
2. determining the objective and subjective causes for developmental tendencies or deviations from the evaluation standards (analysis of causes and possibilities of influencing them);
3. determining and generalizing the best methods and experience, helping one another;
4. making managerial decisions concerning the use of reserves.

At the XIIth Farmers Congress of the GDR, Comrade Erich Honecker emphasized: "The main thing is to track down the reasons for good or bad results, to learn the lessons of the best and to draw the appropriate conclusions. This will help everyone."<sup>1</sup>



The point of departure for the analysis and evaluation of production and efficiency are the four primary indicators of self-production, net production, profit, and costs. Starting with these very summary indicators, the analysis should be extended further. At the center of focus are:

--In plant production: Use of the land to maintain and increase its fertility as well as the full exploitation of the potential yield of plants.

--In animal production: Full exploitation of the potential capacity of the animals and a profitable utilization of fodder.

--In all enterprises: A high level of efficiency in the business' production processes, which will express itself in high net production, profit, and low costs.

In business-management analyses in the LPG's and VEG's, the findings obtained in the course of the analysis can be classified or subdivided along two lines:

First, one has to determine what contribution the enterprise has made to the common results of all the cooperative partners in their uniform agricultural production processes. Secondly, the enterprise's results are comprised of the contributions of many work collectives (divisions, brigades, stall collectives). Each collective influences the enterprise's average in its results and its work methods. If the causes of certain tendencies within the enterprise are to be found or if reserves are to be opened up, the analysis will have to reach from the work collective right down to plot or pen.

From the various goals set for analyses and from one's experience, one can generalize to the following principles for their use by managements:

--Analyses should be thoroughly prepared both in terms of political ideology and in terms of content. Here it is above all a matter of developing in the managers and the collectives a willingness and capability to,

-critically assess their results in comparison with those of the best operating under similar conditions;

-reveal their own deficiencies without reservation;

-pass on the bases of successes;

-learn through an exchange of experience with those who are advanced and introduce their working methods.

--analyses of the planning year (relevant above all for cooperatives and enterprises) are to be followed up with selected questions and supplemented in the course of the year.

--Analyses of cooperatives and enterprises require uniform programs of statistical indicators, guidelines for calculations, and sources of information in order to be able to use centrally supplied data and standards (target values, optimal values).

--Along with economic results, analyses should also include business-management regulations in the LPG/VEG's and their cooperatives. They are to be supplemented by the results of performance comparisons and effectively tied in with moral and material stimulation.

#### Clear Goal Must Be Set for Each Analysis

Starting out with the tasks that have been set for socialist agriculture within the framework of the economic strategy of the 80s, typical goals emerge for analyses in the LPG/VEG and the cooperatives.

Thus, for example, investigations are needed everywhere into the state and developmental tendencies of production and efficiency in comparison with the best operating under similar conditions. Analyses of the scope and effectiveness of scientific and technological progress and of intensification and rationalization measures are also appropriate. Of particular importance is the question of how resources (the work force, the earth, the animals as well as fixed and floating assets) can be efficiently employed and of what the causes are that lead to differences.

In addition, the effectiveness of business-management regulations with respect to their influence on the work collective must be determined, so as to make plain and evident how individual and social interests are to be brought into ever better agreement. Here belong as well investigations into social processes that are being created by the rapid development of the forces and conditions of production and that management must influence with business-management measures, e.g., scheduled improvement of work and living conditions.

Analytical activity should be combined with comparison of performance and socialist competition. Of great importance here is the preparation of time series, mean and best values, with the help of which the performance of LPG/VEG's, their cooperatives and their divisions and brigades can be constantly compared and evaluated.

Comparisons, which can be used for all levels of recording and calculating economic results, are the most important and useful method of analysis. With comparative analyses, it is possible to show convincingly what levels of performance can be attained under given conditions and what subjectively determined differences are to be overcome.

It is first and foremost the comparability of objects that determines meaningfulness. This is influenced by extraordinarily many natural and economic conditions of production, at times intertwined with one another and each affecting the other. To best delimit the objectively determined influences, the plant and animal production enterprises along with the LPG's and VEG's were divided into comparison groups.<sup>2,3,4</sup>

Analyses can only be based on a knowledge of economic results. But they often lead to deeper insights, if--alongside numerically ascertainable facts--the form and method of managerial activity, which can only be expressed in words, enters into economic analyses. Thus, surveys and discussions of their results

must be used in business-economic analyses to determine how the individual regulations contribute to making the agreement of interests, as the prime motivating force behind development under socialism, and the action of economic laws in enterprises, down to the brigades and the workplaces, socially effective. This is an essential requirement to being able to judge the numerous forms of business management regulations with respect to their effect on people.

Consultation with experts and discussion of the facts are essential components of analytical methods. In this regard, field inspections, stall visits and analyses of the workplace are also appropriate.

#### Increased Use of EDP for Economic Analyses

Mathematical-statistical methods are being used more and more, especially in quantitative analyses. In business-management analysis, the gathering and preparation of data must be organized so that a selection, constructed on several levels, of proven and highly condensed information on current situations and developmental tendencies in the LPG/VEG's and their cooperatives is always available. This is a prerequisite to being able to meet the ongoing need for information in the course of the year or information needed for decisions to be made on short notice.

Within the framework of this problematic, we differentiate between three tasks that can be carried out only by using of modern method of calculation:

1. Regular preparation of summarized information on the state and developmental tendencies of production, efficiency, and conditions of production.
2. Case-by-case preparation of more extensive collections of data as working material for research and teaching. Here it is above all actual results, at times with very detailed facts, that are needed.
3. Regular preparation of a selection of business-management indicators (actual results) in the form of business overviews and tables of optical values to be used directly for the management of the LPG/VEG's and their cooperatives.

The possibilities will expand to the degree that micro-electronics and EDP gain acceptance through the use of office computers.

The means of economic analysis include the entire set of instruments, from the figures to the software and hardware of EDV, to the extent this can be applied to analytical tasks.

The economic indicators are of great importance because, as carriers of important information, they are indispensable to the portrayal of economic conditions. Through these indicators, the performances of the cooperative farmers and workers can be portrayed, compared, and evaluated. Since the quality of an analysis' assertions is strongly influenced by an appropriate and rational selection and combination of the indicators, considerable expertise and great care are needed for their application. Thus, the definition of an economic

indicator must include unambiguous determinations of the facts that are to be judged qualitatively and quantitatively. The subject of investigation, performance period, and production conditions must be unambiguously delimited and characterized. A set of instructions for the calculation (algorithm) must capture whence the indicators are to be drawn or from what basic indicators they are to be calculated.

When files are prepared concerning the enterprise's method of calculation and concerning the enterprise's statistics for the different points of time (month, quarter, year), an assortment is available that will fill most of the needs of the analysis.

The four primary indicators of self-production, net production, profit, and costs form the basis of economic analysis. They make it possible to estimate both the enterprise's contribution and the joint contribution of the LPG/VEG's and their cooperatives to supply and to the national income. They do not suffice, however, to make statements concerning the causes of differing results.

Priority must be given in the analysis to starting with results from economic activity that which can be portrayed only with a combination of indicators. To be able to fully record and reflect a given situation, indicators must be assembled that make clear the relationships and correlations in the enterprise's production process. Suitable for this are indicator programs, which record a certain subject matter, and indicator pyramids, which record certain cause-effect relationships.

An indicator program characterizes the object under investigation according to the goal of the investigation. It reflects, with greater or less completeness according to scope and goal, the structure and the level and development of performance of the object under investigation. The more completely a program records the characteristics of a situation, the more relevant the evaluation and conclusions can be to utilization of reserves. For guidance, frame programs for different cases were worked out by scientific establishments. They provide starting points and stimuli for building indicator programs for business-specific analyses.

An indicator pyramid (Figure 1) serves above all to fathom the causes of differing results and to portray cause-effect relationships. They are important sources of knowledge for determination of reserves to increase performance.

The figure shows, in a simplified manner, an indicator pyramid for the primary indicator "net production in marks per VbE [full-employment unit]." This indicator, which is to be calculated for enterprises and their cooperatives, shows the labor productivity. On the first level, it is influenced by the amount of net production and the number of VbE's. The net production, in turn, depends crucially on the proportion of production expenses to the gross production. Both a rise in the gross production and a decline in production expenses have a positive effect on the level of net production.



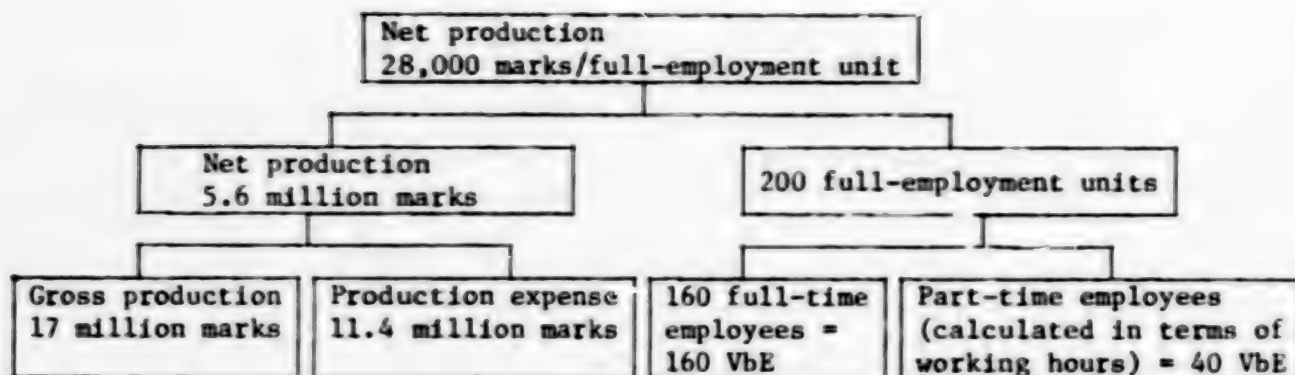


Figure 1. Indicator Pyramid for Portraying Cause-effect Relationships in Evaluating Labor Productivity

In a similar manner, an indicator pyramid can be constructed for the primary indicator of "self-production of the cooperative in GE per hectare of LN (agriculturally useful surface)." On the first level, it depends on the self-production in plant and animal products and on the use of fodder; on the second level, on yields per hectare, performance per animal, losses and fodder use per 100 kg of production.

Along with the choice of indicators, initial attempts to include the levels of management (division, brigade) should be made at the same time, in order to be able to further involve the cooperative farmers and workers in the analytical activity. With each level of an indicator pyramid, the number and detail of the target figures and influential factors grow, and the certainty of assertions concerning the cause-effect relationships as well. With a larger amount of reliable data, this can be formulated mathematically. Here, however, mastery of certain mathematical-statistical methods of computation and the use of EDV are necessary.

#### Adjusting to Future Demands on Time

The future tasks of economic analyses will be determined by the expense-saving intensification of agricultural production which aims at insuring higher production with falling specific costs. This is only possible via the route of comprehensive utilization of scientific-technological progress and the rationalization of methods. Some of the most important challenges for business-economic analysis in the years to come are:

--timely analysis, oriented towards recording causes and recognizing possibilities to influence them, of methods and problems important to business management with the goal of creating bases for political-ideological decisions which can promote the willingness to perform and the awareness of responsibility in the cooperative farmers and workers and perfect the SBW;

--preparation of information and proposals that are suitable for directing initiatives, especially those of scientific-technological progress, within



socialist competition towards the economically most favorable use of natural and economic conditions of production;

--working out effective methods for recognizing unwarranted differences of performance in production and efficiency as well as for a full and timely development of the reserves that depend on this;

--rationalization of the recording and evaluation of massive amounts of statistical data in order to discover potentials for preparing and guaranteeing information for business-management analysis and for other fields of application;

--more closely adapting analyses to the needs of management. They have to provide the bases for decisions in order to be able to actively influence the developmental processes taking place in the enterprises and their cooperatives and to more effectively support the motivation and stimulation of managers and members of the collective.

On the one hand, objectivity and concreteness, and on the other, careful observation of new phenomena and timely orientation towards social or economic developmental tendencies are demanded of those responsible for carrying out analyses. Research into causes must also always be coupled with research into the possibilities of influencing them, so that bases for managerial decisions and for active inclusion of those working in the fields being analyzed can be drawn from the results of the analysis.

#### BIBLIOGRAPHY

1. Honecker, E., "Arbiter und Bauern Hand in Hand fuer Socialismus and Frieden" [Workers and Farmers Hand in Hand for Socialism and Peace], KOOPERATION, Vol 16 No 6, 1982, p 243.
2. Authors collective, "Anwenderinformation Nr 5 fuer die zentrale WTF-Massnahme 'Leistungsvergleich in und zwischen LPG, VEG, und ihren Kooperationen'" [User Information No 5 for the Central WTF Measure 'Comparison of Performance In and Between LPG's, VEG's, and Their Cooperatives']], Ministerium fuer Land-, Forst- und Nahrungswirtschaft, 1982.
3. Mueller, G. and Klaus, H., "Leistungsvergleich in und zwischen Kooperationen (Ergaenzung zur Anwenderinformation Nr 5)" [Comparison of Performance In and Between Cooperatives (Supplement to User Information No 5)], Ministerium fuer Land-, Forst- und Nahrungswirtschaft, 1984.
4. Froebe, B., Fiala, J., and Riwsch, W., "Zur Einordnung von Betrieben in Vergleichsgruppen und Ermittlung von Bestwerten in Rahmen der Leistungsbewertung" [On the Division of Enterprises Into Comparison Groups and the Determination of Optimal Values in the Framework of Evaluating Performance] KOOPERATION, Vol 19 No 2, 1985, pp 54-56.

## Statistical Data Emphasized

East Berlin KOOPERATION in German Vol 19 No 6, 1985 pp 245-248

[Article by Helmut Klaus: "Better Use of Statistical Data From Business Analyses for Evaluating and Increasing Performance"]

[Text] Analyses are carried out annually by the Boehlitz-Ehrenberg Institute for Socialist Business Management of the GDR's Academy of Agricultural Sciences, with the aid of some 400 LPG's and VEG's. These analyses reveal considerable differences in the use of natural indicators (Footnote 1) (Natural indicators are carriers of information concerning the material side of the enterprise's production process. Their use is preferred in planning and calculating levels and development of performance in LPG's and VEG's. They have the advantage that many of these indicators can be reduced from the enterprise level to brigades, stall collectives, plots, and even to individual animals, e.g., yields or performances per hectare or per animal. The term "natural indicator" is used extensively both for intermediate and final products, thus newly created utility values, as well as for raw materials, energy sources, seed and plant material, chemicals, etc.), which summarize a number of intermediate and final products, types of fruits and animals, self-produced and purchased raw materials (fodder), as well as in the evaluation of their usefulness and meaningfulness by the practitioners. Here it is clear that it is only a summary of this sort that makes it possible to relate total production to the primary means of production and to show it to be comparable between LPG's, VEG's, and their cooperatives.

Indicators of yield, performance and cost per hectare of cultivated land, per animal or per 100kg of production, as well as those of animal losses and use of materials, are used everywhere and uniformly. The situation is essentially different with the indicators that are to express, in summary, gross production and its application, losses in plant products or animals in the production process, and similar economic factors. Here, grain units [GE], units of fodder energy [EF], the production values of animals, and animal products (both in GE's and in FE's) as well as live-weight units of cattle [GV = 500kg], and fodder-demand-oriented live-weight units of cattle units [fGV] are available as equivalents. For coarse types and means of fodder, dry-substance content [TS-content] can also be used. Detailed explanations of the use of natural units of measurement are included in planning-method and statistical guidelines<sup>1,2</sup> and in the publications of Werner and Schumann.<sup>3,4</sup>

The following considerations and suggestions are based on experience collected in the Institute for SBW in the analysis and evaluation of production performances of all LPG's, VEG's, and cooperatives in the GDR. The figures needed for the calculations are found in the overview of indicators for LPG/VEG's presented annually to the Kreise councils and the cooperative councils by the ministry. Included here as "optimal values" are the average results of the top 15 percent LPG/VEG's or cooperatives operating under similar conditions. The methodological bases of and practical experiences with gathering and using the optimal values have been published many times.<sup>5,6,7</sup>

### Example of Evaluating Production Performance

Taking comparisons of optimal values as a point of departure, the following will demonstrate possibilities for more extensive use of the natural indicators present in the LPG's and VEG's and those that can be drawn from the overview of indicators to

--evaluate the partners' contribution to the joint yield of the cooperative;

--estimate the influence of fodder use and fodder-energy losses on the self-production of the LPG's, VEG's, and their cooperatives;

--to ascertain reserves that can be developed by lowering losses and better utilizing the yield or performance potentials of plants and animals.

Here, in addition to the calculation of self-production, which is primarily oriented towards measuring and evaluating the performance levels of enterprises and cooperatives for the economy, it has proven useful to implement an additional fodder-energy calculation for the most important steps and segments of the uniform agricultural production process of plant and animal production, in accordance with the directive of 23 December 1983 of the minister of agriculture, forestry, and food production. This action offers the very important advantage to business management of directly connecting the summarizing natural indicators for LPG's, VEG's, and cooperatives with all those for animal production and with the units of measurement and standards for fodder production of the GDR fodder evaluation system that were introduced years ago. The proposals are based on calculations for two plant-production LPG's (A and B) and four animal-production LPG's (1 to 4). In each case, one plant production LPG and two animal production LPG's worked together in a cooperative (cooperatives A and B). The conditions of production were deliberately kept as much the same as possible to clearly show the use of natural indicators and to largely exclude disturbing influences. Five thousand hectares of LN were assigned to each plant-production LPG, of which 1,250 hectares LN were grassland, and 2,000 fGV to each animal-production LPG, of which 1,400 were raw GV's. Harvest yields and the area under cultivation for the most important fruit types were likewise kept the same:

	hectares	100 kg/hectare
grain	2,000	45
potatoes	500	250
sugar beets	250	350
silage corn	400	350
field fodder excluding corn	600	400
grassland	1,250	350
intercropped winter fruits	450	180
sugar beet leaf	250	350
straw fodder	--	(2,000 metric tons)

Table 1. Comparison of Calculating Self-Production and Fodder Energy for Cooperatives (For the sake of simplicity, it was assumed that no changes in stock and no purchases of seed resulted and that no self-products such as fruit, vegetables, special crops or increases in fodder seed were produced)

	Self-production calculation		Fodder-energy calculation	
	Cooperative A	Cooperative B	Cooperative A	Cooperative B
Yield	--	--	16,094 MEF	16,094 MEF
Losses <sup>1</sup>	--	--	- 781 MEF	- 1,094 MEF
Sales of plant products (including [Naturalv.])	85,000 GE <sup>2</sup>	85,000 <sup>2</sup>	15,313 MEF <sup>3</sup>	15,000 MEF <sup>3</sup>
Sales of animal products	+170,000 GE	+165,000 GE	+10,625 MEF	+10,313 MEF
Purchase of animals	- 10,000 GE	- 20,000 GE	- 625 MEF	- 1,250 MEF
Self-produced animal products <sup>4</sup>				
Total	(160,000 GE)	(145,000 GE)	+10,000 MEF	+ 9,063 MEF
Per hectare of LN	( 32 GE)	( 29 GE)	2.0 MEF	1.81 MEF
Purchase of fodder material	- 10,000 GE	- 15,000 GE	- 625 MEF	- 938 MEF
Fodder material from the cooperative	--	--	-10,000 MEF	- 9,687 MEF
Self-production of cooperative				
Total	235,000 GE	215,000 GE	14,689 MEF <sup>5</sup>	13,438 MEF <sup>5</sup>
Per hectare of LN	47 GE	43 GE	2.94 MEF <sup>5</sup>	2.69 MEF <sup>5</sup>

1. Losses from preservation, processing, storage, and transfer. Recorded as losses in TS [dry substance] and converted to MEF ( $\bar{x}$  energy concentration 500).
2. Only from outside of the cooperative.
3. Sales outside of the cooperative and delivery of fodder to cooperative partners. Indicator: natural product of plant production MEF per hectare of LN.
4. Does not belong to the self-production calculation for cooperatives. Included here for comparison with the calculation of fodder energy.
5. Natural product of the cooperative. Calculated as fodder energy from grains, potatoes, sugar beets, and coarse fodder, with reference to the area under cultivation of the types of crops = "cleaned up" LN (identical with LN in the example).

Table 1 contains, in simplified form, the indicators for calculating the cooperative's self-production and for business-management analysis and evaluation of the uniform agricultural production process of plant and animal production for both cooperatives. To avoid the disruptive effects on the portrayal



of the methods of analysis of the different evaluation relationships of the conversion keys for GE and EF at the time, a relation of one MEF = 16 GE was established for all products and production values.

The figures for calculating the self-production do not permit any direct statements concerning the causes leading a clearly lower self-production in cooperative B with the same initial level (plant-production yields) as cooperative A. The fodder-energy calculation, on the other hand, shows:

--due to high conservation losses and a too small proportion of fresh fodder to coarse fodder, 313 MEF of the fodder energy yield was lost;

--the enterprises of cooperative B produce 937 MEF less in animal self-production from the same amount of fodder (10,625 MEF);

--despite greater purchases of animals and fodder materials, the sales of plant and animal products are lower.

In comparison with cooperative A, there is an unwarranted loss of 4 GE per hectare LN or 0.25 MEF of self-production.

The following recommendations can be made for using the natural indicators and the optimal values for discovering reserves:

1. Comparison of the two cooperatives with each other and with the optimal values of their comparison group (Table 2). Since both cooperatives belong to the same comparison group, a simple comparison of a few figures suffices to reveal the level of performance of the animal stock and the fodder use per unit of self-production (MEF of self-production in production values) as the decisive factor in the lower performance of cooperative B. To supplement and broaden this, indicators for the animal production per hectare LN can be drawn into the analysis. The prerequisite for this is that fodder material and animals purchased from outside of the cooperative are not included.

Table 2. Comparison of Two Cooperatives With One Another and With Optimal Values

	Unit of measurement	Optimal value	Cooperative A	Cooperative B
Self-production of:				
Cooperative	GE/hectare LN	50	47.0	43.0
Plant products	GE/hectare LN	50	49.0	48.0
Animal products	MEF/FGV	2.8	2.50	2.26
Fodder use per MEF of:				
Self-production of animal products	MEF	1.00	1.06	1.17
Sales of				
Plant products <sup>1</sup>	GE/hectare LN	--	15	14
Milk	kg/hectare LN	--	1,600	1,340
Meat <sup>2</sup>	kg/hectare LN	--	260	260

1. Purchase of fodder deducted.

2. Purchase of animals (live weight) deducted.



2. Analysis of the contributions of the partners in the cooperative to the joint result (Table 3). In addition, the partners within the cooperative (A) are compared for a few indicators, whereby the level of the individual enterprise is measured against its distance from the optimal values that pertain to it. Within the rather good cooperative A, significant differences in performance appear between the two animal-production LPG's. For LPG 2, the appropriate standard, along with the optimal value of the comparison group, is its own cooperative partner which is supplied with fodder of the same amount and quality.

Table 3. Analysis of the Contribution of the Partners in Cooperative A to the Joint Result (Self-production of the cooperative)

	Unit of measurement	Cooperative A	LPG-P <sup>*</sup> A	LPG-T 1	LPG-T 2
Self-production of Cooperative	GE/hectare LN	47.0	--	--	--
	Percent <sup>1</sup>	94	--	--	--
Plant products	GE/hectare LN	49.0	49.0	--	--
	Percent <sup>1</sup>	98	98	--	--
Animal products	MEF/fGV	2.50	--	2.63	3.37
	Percent <sup>1</sup>	89	--	94	85
Fodder use per MEF of Self-production of animal products	MEF	1.06	--	1.01	1.12
	Percent <sup>2</sup>	106	--	101	112

\* LPG-P = plant-production LPG, LPG-T = animal-production LPG

1. Of optimal value.
2. Of optimal value, where a rising percentage indicates a negative development.

3. In practice, it is not infrequent that adjacent LPG's or VEG's belong to different comparison groups due to differing natural conditions of production. Calculating the distances of the business indicators from the respective optimal values allows direct comparison here as well (Table 4). The reference to the specific optimal values makes the statements relative and makes clear, in the example, that plant-production LPG C does have higher absolute yields than LPG A, but does not exploit its production potentials as well.

Table 4. Comparison and Evaluation of Two LPG-P's [plant-production LPG's] With the Aid of the Distances of Their Indicators From the Optimal Values of Their Respective Comparison Groups

	Unit of measurement	LPG-P A comparison group 33.2		LPG-P C comparison group 14.0	
		Indicator	Percent of optimal value	Indicator	Percent of optimal value
Self-production of plant products	GE/hectare LN	47	94	50	90
Yields: Grains	100 kg/hectare	45	93	50	88
Potatoes	100 kg/hectare	250	97	250	93
Sugar beets	100 kg/hectare	350	96	350	90

Table 5. Reserves To Be Obtained by Reducing Losses (Comparison of two LPG-P's [plant-production LPG's])

	Unit of measurement	LPG A	LPG B
1. Dry substance in greens	1,000 kg	18,100	18,100
2. Dry substance in coarse fodder material	1,000 kg	16,453	15,800
3. Difference from line 1 <sup>1</sup>			
--Dry substance	1,000 kg	1,647	2,300
--Dry substance	percent	9.1	12.7
--Fodder energy	MEF <sup>2</sup>	824	1,150
4. Reserves to be obtained from LPG B	MEF	--	326

1. Coarse fodder losses from preservation, processing, storage, and transfer.
2. With  $\bar{x}$  energy concentration 500.

4. Statements concerning reserves that could be developed can be derived in a relatively simple manner from the figures on losses in fodder energy (Table 5). The TS-content of the greens and coarse fodder material can be calculated using Form 511-11/2. Direct conversion of the original materials into MEF is also possible. Given an exact record of the greens and the coarse fodder material, a simple comparison makes it possible to find some causes of the differing levels of preservation, processing, storage, and transshipment losses (Table 6). The expansion in use of fresh fodder and in grazing as well as the reduction of silage loss are the most important measures for the development of production reserves in the vicinity of 326 MEF.

Table 6. Proportions of Fodder Energy From Coarse Fodder and Losses in Two Plant-Production LPG's

	Plant-production LPG A		Plant-production LPG B	
	Portion of fodder energy from coarse fodder <sup>1</sup> percent	$\bar{x}$ losses per	Portion of fodder energy from coarse fodder percent	$\bar{x}$ losses percent
Fresh fodder; of which:	60	2.5	45	2.5
Pasture	40	2	20	2
Wilted and corn silages	20	20	27	22
Fresh silages	13	24	21	28
Hay	7	27	7	30

1. Not including straw fodder.
2. Not recorded; taken to be zero.

5. Further reserves are to be found in better utilization of the potential yield of the animals and in an economical use of fodder (Table 7). In the example, the initial values for fodder use (line 1) have intentionally been kept the same for the subjects of the comparison. Cooperative A corresponds, in its fodder use per MEF of self-production (in production values; line 3),

more or less to the performance-dependent fodder energy demand; animal-production LPG 2 lies slightly below this. Along, however, with the unfavorable relation of fodder performance to fodder preservation, the indicators of cooperative B and animal production LPG 2 also reflect fodder use lying above the norms. As line 5 shows, the reserves are considerable.

Table 7. Uncovering Reserves in Fodder Use Through a Comparison Between Two Cooperatives of the Total Figures for Animal Production

	Unit of Measure- ment	Coopera- tive A	Coopera- tive B	Cooperative 1	
				LPG-T 1*	LPG-T 2
1. Total fodder use	MEF	10,625	10,625	5,313	5,313
	MEF/fGV	2.65	2.65	2.65	2.65
2. Total self-production of animal products	MEF	10,000	9,063	5,260	4,740
	MEF/fGV	2.50	2.26	2.63	2.37
3. Fodder use/MEF of self-production	MEF	1.06	1.17	1.01	1.12
4. Possible self-production with fodder use = 1.06		--	10,000	--	--
(1.1:1.3) = 1.01		--	--	--	5,260
5. Production reserves	MEF	--	937	--	520

\*LPG-T = animal-production LPG

One must note, in such comparisons, that the fodder-use indicators determined for the animal-production enterprise form the basis of the fodder energy supplied as coarse fodder material. An MEF of fresh fodder is thus the same as an MEF of silage or hay, even though 20 to 30 percent of the fodder energy harvested from the field has already been lost in the production of the latter fodder material.

6. The examples refer to the evaluation of 1 year. It is strongly recommended that the selected indicators also be included in the analysis and evaluation as time series (Figure 2).

#### Effectively Combining Enterprise's Statistics With Central Statistics

All LPG's and VEG's are required by law to regularly provide production figures to the State Central Administration for Statistics. In using these centrally stored data for business-management investigations, the natural indicators frequently show deviations from the values in the enterprise, while differences are rare in financial reports. Otherwise identical conditions and can mostly be attributed to technical mistakes.

As the analyses showed, the main cause of differences in the material realm is the insufficient connection of the enterprise statistics with the state statistics. The enterprise statistics prefer indicators referring to hectares, fGV, VbE or animals. The State Central Administration for Statistics demands, on the other hand, absolute figures of measurement, where holes or double recordings in proof of the products and their use often are not noticed until

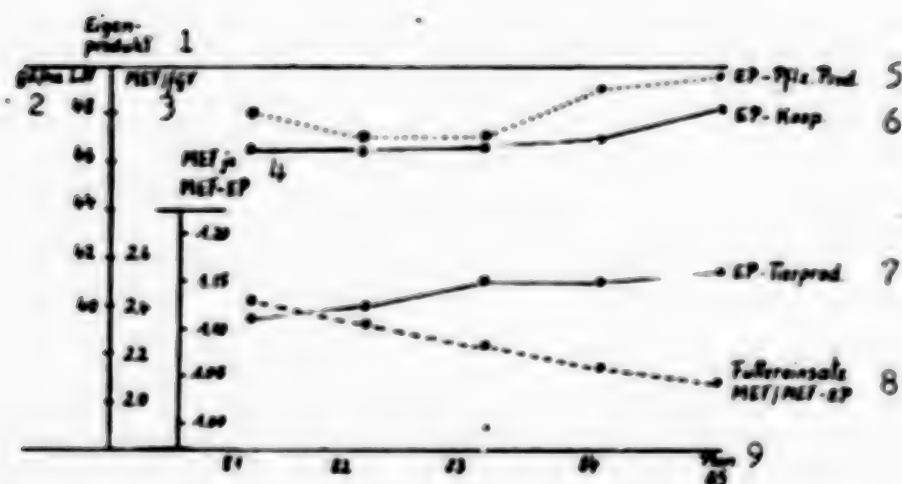


Figure 2. Time Series of Selected Natural Indicators for Cooperative A (Self-production and fodder use from 1981-1985)

Key:

1. Self-production
2. Grain units per hectare of agriculturally useful land
3. MEF per fodder-demand-oriented live-weight units of cattle
4. MEF per MEF of self-production
5. Self-production of plant products
6. Self-production of cooperative
7. Self-production of animal products
8. Fodder use MEF per MEF of self-production
9. Projected

the cooperative councils, LPG's, and VEG's compare the values they calculated themselves with the centrally calculated indicators. Such deficiencies have a particularly disruptive influence on the analysis and evaluation of the joint level of performance of plant and animal production. Differences between the plant production reported as supplied and that reported as used in animal production, for example, are scarcely noted in the enterprises, but they have very negative effects on the collation of indicators for a uniform agricultural production process. Thus, it is recommended that the LPG's and VEG's calculate at least some of the indicators for self-production, fodder use, and losses themselves, on the basis of the absolute figures reported to the State Central Administration for Statistics, and so achieve a higher level of certainty.

The success of every analysis depends ultimately on the ability and willingness of the managers and the collective's members to pursue the causes of differences in level of performance right down into their own workplaces. It is always crucial that the technical-organizational implementation be preceded by a political-ideological preparation. Only when the managers and the collectives are agreed on the goal, content, and form of the analysis and participate in working it out, will they also acknowledge its assertions and be willing to develop initiatives for determining reserves as one of the important concerns of analysis.



## BIBLIOGRAPHY

1. "Methode zur Berechnung des Bruttoumsatzes der Pflanzen- und Tierproduktion in Getriedeeinheiten (GE)" [Methods for Calculating the Gross Profit of Plant and Animal Production in Grain Units (GE)], Staatliche Zentralverwaltung fuer Statistik, Berlin, November 1980, 6 pp, fourth printing.
2. "Hinweise zum Betriebsplan 1985" [Guidelines for the 1985 Business Plan], Ministerium fuer Land-, Forst-, und Nahrungsgueterwirtschaft Berlin 1985 (LW 190), 4 pp, first printing.
3. Werner, K. and Schumann, S., "Betriebswirtschaftliche Methoden und Arbeitsmittel zur Bilanzierung und Wertung von Aufwand und Ergebnis in der Futterwirtschaft" [Business-Management Methods and Working Material for Balancing and Evaluation of Cost and Result in the Economy of Fodder], KKOOPERATION, Vol 17 No 10, 1983, pp 470-48 and KKOOPERATION, Vol 18 No 10, 1984, pp 311-314.
4. Werner, K., "Betriebswirtschaftliche Methoden und Arbeitsmittel zur Bilanzierung und Wertung des Futteraufwands und der Leistungen in der Gefluegelwirtschaft" [Business-Management Methods and Working Material for Balancing and Evaluation of Fodder Cost and Levels of Performance in the Economy of Fowl], KKOOPERATION, Vol 19 No 1, 1985, pp 24-26.
5. Autorenkollektiv [authors collective], "Anwenderinformation No 5 fuer die zentrale WTF-Maassnahme 'Leistungsvergleich in und zwischen LPG, VEG, und ihren Kooperationen'" (User Information No 5 for the Central WTF Measure 'Comparison of Performance In and Between LPG's, VEG's, and Their Cooperatives'), Ministerium fuer Land-, Forst-, und Nahrungswirtschaft, 1982.
6. Mueller, G. and Klaus, H., "Leistungsvergleich in und zwischen Kooperationen (Ergaenzung zur Anwenderinformation Nr 5)" [Comparison of Performance In and Between Cooperatives (Supplement to User Information No 5)], Ministerium fuer Land-, Forst-, und Nahrungswirtschaft, 1984.
7. Froehle, B., Fiala, J., and Riwsch, W., "Zur Einordnung von Betrieben in Vergleichsgruppen und Ermittlung von Bestwerten in Rahmen der Leistungsbewertung" [On the Division of Enterprises Into Comparison Groups and the Determination of Optimal Values in the Framework of Evaluating Performance] KKOOPERATION, Vol 19 No 2, 1985, pp 54-56.

12507/9365

CSO: 2300/519



STRUCTURAL CHANGES, PRODUCTIVITY IN FARM SECTOR ASSESSED

West Berlin FS-ANALYSEN in German No 6 1984 (signed to press Dec 84) pp 5-25

[Paper presented at the 10th Symposium of the (West) Berlin Research Institute for Inner-German Economic and Social Issues on 22-23 Nov 84. The speech was delivered by the Graduate Agronomist Karl Hohmann. Original title: "Organizational Changes and Performance Development in the Agricultural Sector."]

[Text] 1. Status at the Beginning of the 1980's

"The goal and result of the increase in the level of concentration in agriculture according to the plan under socialistic conditions of production consist of improvement of operating conditions of the totality of the production forces in society, of a relatively higher economy of all elements of the production process and not simply of pooling of means of production, manpower or production itself. A measurable indication of achievement of this goal is the increase in production, productivity of labor, reduction in cost per unit of product, increase in net income of the operation and improvement of working and living conditions of collective farmers and agricultural workers. Any rise in the level of concentration which does not lead to these results benefits neither society nor the agricultural operation: it is pointless."

This quotation from a book<sup>1</sup> published in 1976 by the Dietz Verlag written by a team of authors from the "Agriculture Specialty of the Chair for Political Economics of Socialism at the Institute for Social Sciences of the Central Committee of the SED," which may be read again verbatim in a second book published in 1980 by this group of authors<sup>2</sup>, accurately describes the results hoped for by the SED from the industrialization of agriculture.

At the beginning of the 1980's, the SED clearly had to realize (finally) that, measured by these standards which they themselves had established, the attempt to impose "industrylike" concentration and specialization processes in the agricultural sector for socio-political reasons and (inevitably) without business and economic justification<sup>3</sup> was an economically expensive experiment. Comparing the 1971-1975 and the 1976-1980 5-year plans, it was in fact impossible to increase food production based on plants; food production based on livestock could only be raised with the help of increasing feed imports

from Western countries<sup>4</sup>. The productivity of labor (dtGE/AK [decitons (1 dt = 100 kg) of grain units/manpower outlay] did in fact clearly rise, however, less sharply than in the "non-industrylike" agriculture of the FRG; consequently, the GDR's lag behind the FRG in this category increased from approximately 40 percent in the years from 1966-1970 to approximately 50 percent in 1976-1980<sup>5</sup>.

Concurrently, however, significant growth rates in production consumption were recorded; as a consequence, not only did the cost per unit of product—marks of production consumption (including subsidies)/marks of net product—increase in the agricultural sector by approximately 35 percent between 1975 and 1980<sup>6</sup>, but, as Table 1 shows, "profits" remaining in agricultural and forestry operations after payment of taxes and deduction of expenses for operational investments and payment of employee wages fell off by approximately 30 percent. This last fact is all the more remarkable since, by means of clearly higher subsidies (Table 1), during this period both capital goods prices and producer prices were held stable on the whole in the agricultural sector; the decreased efficiency was consequently not caused by prices, but by expenses which rose absolutely in the absence of increased yields.

The Decree of the Council of Ministers relative to the "Continued Development of Economic Measures in Socialist Agriculture and the Foodstuffs Industry From 1981 On," promulgated in May 1980, while the late Gerhard Grueneberg, the Politburo member responsible for SED agricultural policy and Central Committee Secretary for Agriculture, Forestry and Foodstuffs, who died in 1981, was still alive, may be interpreted as the first external sign of a correction of SED agricultural policy, previously organized exclusively around an industrylike production system<sup>8</sup>. It is known that this decree included the uncompensated cutting of the investment, subsidy and price preferences for industrylike systems gradually enlarged in the years after 1968<sup>9</sup>, which, contrary to SED expectations, made production not less expensive, but rather considerably more expensive than the existing barns and systems of more limited capacity<sup>10</sup>. Clearly, it was not until this period that the idea made its way to the upper echelon of the SED, or could be made public, that, as Prof. Nau of Humboldt University stated in an article which appeared shortly before the 10th SED Party Congress in April 1981, "excessively high levels of concentration suitable for the throughput capacity of individual aggregates entail expenditures which not only offset possible savings in the area of costs for this equipment, but even surpass them," and that "the application of efficient livestock production methods is linked much less to high concentrations of animals than is generally assumed," since "the genetic production capacity of a domestic animal may only be developed to the degree that it is possible to adjust production methods and conditions to biological requirements—and that has virtually nothing to do with the size of the herd in which the domestic animal is found."<sup>11</sup> His conclusion "that the increases in yield per animal achieved by means of the application of progressive (the author: industrylike) methods are attainable to a suitable degree with the aid of conventional production processes,"<sup>12</sup> was already indirectly acknowledged by Heinz Kuhrig, Minister of Agriculture under Grueneberg from September 1973, in the fall of 1981 as he announced the final discontinuation of new construction of industrylike facilities at the 3rd Central Committee

Session (1981)<sup>13</sup>, shortly before his replacement as Minister by Bruno Lietz. In cases when new stable facilities were built after this time, the dimensions were reduced to about one-third of the plant capacities striven for in the 1970's.

It is also interesting that since then, when partial renovation of internal systems in existing industrylike facilities is needed, it is even judged appropriate "to designate only partial areas for the previous use and to utilize the remaining space for a combination of pre- and post-storage or other production uses."<sup>14</sup> This is diametrically opposed to what the SED would have deigned to consider industrylike livestock production and especially industrylike livestock production facilities as showcase examples of the production units desired during the 1970's.

However, as at least one of the authors of the book quoted at the beginning concluded in Number 12/ 1982 of WIRTSCHAFTSWISSENSCHAFT, it is not only in livestock production, but also in plant production that "the economics of the outlay of hard, tangible work has not developed as hoped."<sup>15</sup> What is hidden behind this vague statement emerges again from an article by Prof. Tillack (Karl Marx University, Leipzig) in Number 1/1983 of the INTERNATIONALE ZEITSCHRIFT DER LANDWIRTSCHAFT. Through his studies, he comes to the conclusion, among others, that in comparing the years from 1973 to 1975 with the year 1980, prime costs in GDR plant production operations and livestock production operations have risen by 21 percent and 13 percent respectively and that gross profits have decreased by 24 percent and 15 percent respectively<sup>16</sup>.

## 2. Structural and Economic Measures

From an agrarian policy standpoint, the 3rd Central Committee Session (1981) and the 7th Central Committee Session (1983), in spite of the 10th Party Congress (1983) and the 12th Farmers Congress (1982), are to be considered the two outstanding events of the eighties. Constantly increasing agricultural consumption of energy resources and raw materials without regard for climbing import prices (until 1981), reduction of Soviet petroleum deliveries beginning in 1982 and the GDR's strained foreign exchange situation led the SED to organizational and structural interventions in the agrarian sector along with the establishment of drastic quotas for agricultural capital goods after the 10 Party Congress or to altered forms of work organization on the farms. As can be seen in Table 2, investments were reduced by approximately 8 percent in 1982 and by another 10 percent in 1983, development of new irrigation areas was halved and delivery of fertilizers (primarily nitrogen and phosphate) and delivery or import of tractors and grain was cut by approximately 20 percent compared to the 2 previous years. Nevertheless, in 1983, through good management it was possible to obtain an approximately M 0.2 billion higher net product in the agricultural sector with approximately M 1.1 billion lower production consumption compared to 1981 (Table 1), in other words, to effect the improvement in outlay and yield in the agrarian sector striven for since the 10th Party Congress. Furthermore, compared to 1981, significantly higher "profits" were also achieved in agriculture and forestry (LuF), which however upon closer examination resulted exclusively from cancellation of investments,



that is, the drop of operational investments from M 3.2 billion (1981) to M 1.0 billion (1983)--a measure, which can by no means be continued permanently without jeopardizing production.

The last column of Table 1 presents the author's attempt to evaluate the effects of the agrarian price reform which went into effect on 1 January 1984 on the production process and profitability in the agricultural sector<sup>17</sup>. It must however be noted here that, because of the persistence in setting producer prices, the gross product and the net product of the LuF is shown to be just as superelevated as the subsidies guaranteeing stable food prices; and, furthermore, price increases for machinery and construction<sup>18</sup> led to the fact that in 1984, with M 2 billion investments, it was possible to obtain only slightly more capital goods than in 1983.

The provision of the Decree of the Council of Ministers for agrarian price reform<sup>19</sup>, according to which after 1984 the same industrial prices as are applicable in all other branches of the national economy are to be charged to agricultural operations<sup>20</sup> (no renewal of freezes in rising industrial prices), will however already be broken to a certain extent for 1985. Beginning in January 1985, a renewed freeze, at least for building materials, new construction and building repairs, will be in effect<sup>21</sup>--but at the 1984 level. For all other industrial preliminary outlays, operations involved in plant and livestock production will pay the new, higher industrial prices. According to the law gazette<sup>22</sup>, the cost increases caused by this are to be compensated for through reduction of taxes, alteration of location-related surcharges or through variances in individual producer prices.

As already mentioned, since the 10th SED Party Congress, in addition to purely economic measures, consisting primarily of the reduction of deliveries of motor fuel and other fuels to farms, which will be treated further elsewhere, drastic changes in the SED's agrarian policy design have also occurred. They may be characterized by the terms "regional organization" and "cooperative councils."

## 2.1 Cooperative Councils

How much the SED's altered agrarian policy ideas, which can be interpreted as a reaction to foreign and domestic economic constraints, differ in the eighties from those of the seventies should be apparent from the following quotations. While Gerhard Grueneberg was already explaining in 1975 that "those times are past when only as many animals were maintained on one farm or in one given region as the feed production in the crop cycle supported," and that trends "where plant and livestock production in the territory of the cooperative plant production division continue to be developed as in a large LPG [agricultural cooperative] (lead) to economic losses,"<sup>23</sup> Honecker stated at the opening of the 3rd Central Committee Session that it is particularly necessary "to take care of the stand of livestock in each respective region increasingly out of its own feed production (the author: that of the respective region)."<sup>24</sup> While it was still possible for the SED Central Committee to be told in a book published in 1978 by a team of authors from the Karl Marx party university: "The decisive consequence of the realization of the objectively necessary, industrylike model of specialization and

concentration of production consists of mastering, according to plan and gradually, ..., the direct technological, organizational and economic combination of plant and livestock production in an LPG or a VEG [nationally owned farm],<sup>25</sup> it was not just Honecker who came to the conclusion at the time of the 3rd Central Committee Session that "the work of the cooperative councils had evolved into the key issue," which is why "everything ought to be encouraged which is suited to uniting plant and livestock production more closely...."<sup>26</sup> Within that context, however, "those things which are worthwhile and those which are not" ought to be monitored "with discrimination and farsightedness."<sup>27</sup>

The realization, obviously arrived at as a result of monitoring by the Politburo, that is, that the plant and livestock production cooperative councils must, with full consciousness of their responsibility in the standardized production process, increasingly perform "the function of a business management entity while preserving the legal independence of the LPG's and the VEG's," was publicly announced 2 years later at the opening of the 7th Central Committee Session (1983) by Werner Felde (Grueneberg's successor in the Politburo)<sup>28</sup>. It was then, at the latest, that not only Western observers but also the comrades in the GDR began to ask: "Are plant cultivation and livestock farming being reunited?"--at least according to the headline of an article in the Erfurt district newspaper DAS VOLK of 4 January 1984. The article began:

"So are we melting plant and livestock production back together again and creating large LPG's? Why another change so soon in agriculture? The decision of the Politburo of the SED Central Committee concerning the further deepening of the cooperative relationships, according to which the cooperative council assumes the function of a business management entity, is providing plenty to talk about in the villages. Was the division of labor between plant and livestock production carried out in the seventies not worthwhile? Did specialization make no contribution? Is everything previously treasured to be jettisoned? Many cooperative farmers are currently debating that."

This questioning was justified since "cooperative councils" were in fact originally established, that is, in the years between 1966 and 1971, as managerial bodies for interfarm cooperatives (KOG's), or large LPG's, in which at least 2, and at most 4 to 6, LPG's and VEG's, which at the time still included both plant and livestock production, were combined into cooperatives<sup>29</sup>. Following the rejection of the KOG, or the large LPG, as the wrong route (in the opinion of the SED) to industrylike production methods<sup>30</sup> and the operational specialization which was nevertheless introduced into LPG (and VEG) plant production and LPG (or VEG) livestock production, the "Cooperative Councils for Plant Production," composed of the responsible leaders of the plant production division of the original LPG's and VEG's, functioned as managerial bodies ("KAP [Plant Production Division Cooperative] Councils") of the resultant KAP's<sup>31</sup>. With the conversion, beginning in 1974, of the KAP's into LPG(P)'s [LPG's for plant production], most of these councils evolved into the subsequent LPG executive boards.



The specialization in animal and plant production operations and the exclusion of individual operations from the farms into cooperative establishments (ACZ [agrochemical centers], ZBO [interfarm construction organizations], drying and pelletizing plants, etc.) again made new cooperative councils for the coordination of increasingly interfarm (rather than innerfirm) horizontal supply and service relationships at higher levels necessary. Thus, in the heyday of specialization (1971 to 1978), there were, in addition to cooperative councils for plant production, cooperative councils for livestock production and—already appearing as the most numerically significant groups at that time—cooperative councils for plant and livestock production. It was their job to work out recommendations for improved cooperative combinations of the specialized, independent agricultural operations, or to organize and supervise supply and service contracts between operations.

These plant and livestock production cooperative councils are now in a position, according to the intentions of the 7th Central Committee Session (1983), to manage, plan and financially evaluate "plant and livestock cooperations" (not the cooperation between plant and livestock farms as previously) as a self-contained economic mechanism<sup>32</sup>. As a rule, these "cooperations" are made up of a plant production operation and the livestock production operations it supplies with feed. In the 1,170 "cooperations" currently in existence, in 168 cases, 1 plant production operation supplies only 1 livestock production operation; and in 120 cases, 4 or more animal production operations are supplied by 1 plant production operation; that means that in approximately 880 "cooperations," 1 plant production operation is combined with 2 or 3 livestock production operations<sup>33</sup>. The 288 "cooperations" in which VEG's participate have proved to be especially problematic with regard to "the great responsibility that the cooperative councils have assumed to further allocate the governmental planning indexes for cooperation of the individual LPG's handed down to them by the district councils and to pass them on, along with other indexes, norms and recommended values (the author; established by the cooperative council) as the basis of operating plans."<sup>34, 35</sup> In addition to general issues of organization, management, planning and accounting, therefore, it is to be especially demonstrated, by means of the practical experiments ("test-runs") launched in 1984 in the entire Gera district and selected "cooperations" in other districts, how the VEB's under the district councils or the VVB's [associations of VEB's] may be included in the "cooperations" without any perceptible limitation of the district's management authority<sup>36</sup>. As Honecker explained at the opening of the 9th Central Committee Session (22 and 23 November 1984), such tests took place in 1984 in a total of 88 "cooperations," as a result of which the Politburo decided "gradually to transfer managerial functions to the cooperative councils in all "cooperations" of LPG's and VEG's in the years 1985 and 1986—naturally upon the resolution of the general meeting of the membership or the decision of the directors of the nationally owned farms [VEG's]."<sup>37</sup>

Whether and to what extent the idea expressed by Bruno Lietz at a VEG meeting at the end of 1983 that the role of the VEG's, "including the funds required for them, be classified as a "subordinate item" in the plans of the cooperations,"<sup>38</sup> is still valid, is impossible to determine definitively because of the restrained publicity practices of the SED. However, it seems

certain that the practical experiments of 1984 concluded that "even further movement is necessary in the transferral of rights and responsibilities of the cooperating farms to the cooperatives council (...) than was assumed by the Farmers Congress (1982)."<sup>39</sup> Continued evolution of plant and livestock production cooperative councils into an industry-wide management organ seems to be just as much preprogrammed as a (backward) evolution of the LPG (and VEG!?) into a specialized branch of the economic mechanism of cooperation.<sup>40</sup> That signifies however, in actuality, a return to a form of organization, the external appearance of which shows remarkable similarity to the formerly rejected KOG or the large LPG, with the single distinction that now farms are cooperatively combined with each other in "cooperations" specializing in plant or livestock production, while formerly they were in KOG's, LPG's or VEG's with well-formulated production programs<sup>41</sup>. The SED is obviously attempting, within the framework of the cooperative council, to return to the highly structured agricultural enterprise units producing through the combination of several operational branches balancing differentiating and integrating forces which the SED thought it had created ad absurdum through concentration and specialization in the seventies. For, as one may read in the Erfurt district newspaper of 4 January 1984 quoted above: "What I divide, I must reunite on a higher level in order to achieve production results through combination. We have now arrived at this point in agriculture."<sup>42</sup> However, this means that the specialization in plant and livestock production carried out in the seventies was an unnecessary and economically costly detour on the road to organization of an industrylike agrarian production system--or what the SED now defines as such.

Even as the debates about the mission and authority of the cooperative councils and the "mutual funds for investment to stimulate higher production (the author: bonus funds) and for reserves" (the author: risk funds) to be created by them continue, Honecker was announcing at the opening of the 9th Central Committee Session (1984) that the Politburo had been considering the experiences of the Agricultural Industrial Associations (AIV) first presented at the 9th SED Party Congress (1976)<sup>43</sup>. That concerned "the voluntary cooperation of LPG's and VEG's in plant and livestock production with the agrochemical center, the land improvement cooperative, the interfarm construction organization and additional enterprises and establishments for processing and storage of agricultural products as well as for maintenance."<sup>44</sup> The Politburo had determined that these issues ought to be dealt with at a central discussion with agricultural leadership cadres and practitioners and in March at the district farmers conferences<sup>45</sup>.

It is noteworthy for this report that the AIV is to include plant and livestock production in the future--as a rule, the experiment with the AIV's was previously limited exclusively to field crop production operations--and that the SED obviously considers the "cooperations" operating on approximately 5,000 hectares as merely a transitional form leading to the AIV's encompassing an LN [agriculturally productive land] of some 25,000 hectares. These represent not only a horizontal form of cooperation (like the "cooperations") but also include characteristics of a vertical integration of the agricultural sector, which was previously supported primarily by cooperation unions [KOV] organized along product lines (grain, potatoes, milk, meat, etc.). Their job was to create production chains from production through handling and

processing to sale, partially to retail sale (KOV shops), and to organize the WTF [expansion unknown] and breeding advances as well as the vertical supply and service relationships uniformly<sup>48</sup>. How these KOV's can be integrated into the AIV's in the future, should the plans suggested by the SED for the AIV's be carried out--or if they will then be dissolved as superfluous--cannot be foreseen at present. If it should actually ever develop that GDR agriculture one day is organized into approximately 260 AIV's (based on the number of existing ACZ's), it will certainly be appropriate to speak of "agrarian combines," a term which seems to apply in only a limited way to the 1,170 cooperations now in existence (due primarily to their relatively limited size)<sup>47</sup>.

## 2.2 Regional Organization

The changes carried out since the end of 1980 within most agricultural operations in the work organization of the farms themselves remain unaffected by the tendency toward expansion (for the time being only economic and not in terms of area) of the agricultural planning unit which began in the course of the rediscovery of the "historically developed unity of the agricultural reproduction process" following the 3rd Central Committee Session (1981)<sup>48</sup>.

The beginning reduction of the fuel allocation available to agricultural operations (especially to plant production operations) had already compelled many farms, long before the 3rd Central Committee Session, to alter their organization in favor of regionally organized divisions and work teams, so that Honecker could only state: "There are many new impulses and also interesting experiences. ... In this connection, forms of the regional production organization, currently applied successfully in many LPG's, seem valuable. Closer ties to the village, direct responsibility for the land, more efficient cooperation with livestock-producing LPG's, shortened shipping distances, lower transportation outlays: these and other advantages favor regional production divisions or work teams."<sup>49</sup> These advantages did not just come into existence in 1981, but were also present in the seventies when the farms were required, in the course of development of specialization, to reorganize their work teams, regionally oriented until then, according to work type or production<sup>50</sup>. It was only through this regional orientation of the organization of labor in plant production operations (within 2 years, the sector of regionally organized plant production operations climbed from 48 percent<sup>51</sup> to more than 60 percent<sup>52</sup>), with almost total agreement of the area served by the regional divisions with the livestock production operations to be supplied with feed by each, that many LPG(P)'s [plant producing LPG's] and VEG(P)'s [plant producing VEG's] were able for the first time to sustain production again in the face of the reduced fuel allocations. In individual cases, as for example "in the Demmin LPG(P), where work has been organized since 1 January 1981 in three regional production divisions with stable collectives, enterprise-owned funds and their own technology," it was possible to reduce transportation expenses to 65 percent, transportation distances from 6.5 km to 3.5 km and travel and transfer time from 17.8 percent to 8.5 percent of man-hour outlay<sup>53</sup>.



Since with regional forms of organization not only are energy resources conserved and costs reduced, but also higher proportions of available man-hours can be applied to productive activities, the regional principle is to become the ruling principle in order to achieve a comprehensive "regional gearing-down of economic demands" until 1990<sup>54</sup>. Thus, "the pro and con of working according to the regional principle has no longer been an issue for a long time"<sup>55</sup>--at least in the cooperations in which no (or "only" relatively small) industrylike systems were installed during the seventies. Due to the size and therefore the required area served by existing central storage and processing facilities for feed supply or operation, regional organization was hardly possible in other operations<sup>56</sup>. The highly touted experiment of industrialization through concentration and specialization in the agrarian sector for the "program" is not only now obstructing the organizational and structural changes in agriculture currently sought by the SED more than it is reinforcing them, but will do so for the next 20 to 30 years--not to mention the continually rising costs during that period.

Nevertheless, it was in spite of, or even because of, the cuts in capital goods and energy resource deliveries to the agricultural sector forced by foreign economic conditions and the organizational changes induced by them, including the complete substitution of (raw) brown coal for heating oil sought by the end of 1983<sup>57</sup>, that the agricultural sector was able in 1983 to achieve a higher net product than in 1981 for the first time with lower real production consumption (Table 1). As Werner Felte reported to a meeting in April of this year, in 1983 GDR agriculture consumed among other things 61.2 percent less heating oil, 54 percent less carburization fuel and 16 percent less diesel fuel than in 1980<sup>58</sup>. Even though the full substitution of brown coal for heating oil sought by the end of 1983 was not achieved, these are noteworthy successes, which could not have been realized without the adjustments in agrarian policy of recent years--and certainly not without the supportive effect of weather conditions in 1982 and 1983.

### 3. Evolution of Output

As shown in Table 2, in addition to the supply of liquid energy resources, after 1981 drastic reductions also took place in the delivery of nitrogen fertilizers (since they are exportable) as well as phosphate fertilizers and tractors (since they are imported). Furthermore, in 1982 investments in the agricultural sector were reduced by approximately 8 percent and by approximately 10 percent in 1983, which particularly affected the continued expansion of irrigated acreage. Of special significance for livestock processing and supplying the population with food of animal origin were, however, the drastic cuts in grain imports introduced after the 10th Party Congress, along with efforts by the GDR to expand its meat and slaughter animal export activity.

While in fact in spite of the supply reductions and the dry summers of 1982 and 1983, gross production from the land was hardly declining, although almost exclusively because of the unusually high grain yields for GDR conditions, the 1982 reduction of grain imports resulted in clear declines in output in livestock production (Table 3), which, along with the export efforts of the GDR in this sector, led to the domestic supply problems described by Honecker

at the 5th Central Committee Session (1982) as "disruptions in rhythm."<sup>59</sup> But the setbacks of 1982 were already recouped in 1983 and the 1981 and 1982 level was almost reached again.

For that reason the SED may note with some satisfaction that the grain problem, which, according to statements of their General Secretary, was affecting the vital interests of the republic and comparable to the petroleum problem<sup>60</sup>, can at least be considered to be somewhat neutralized in as much as it was possible to surpass the objective of the directive of the 10th SED Party Congress for the 1981-1985 5-year plan to reduce grain imports by 1985 "by at least 1 million tons compared to 1980." With approximately 3 million tons on the average in the years from 1981-1983, approximately 1.2 million tons less were in fact imported; however, protein feed imports climbed during the same period by approximately 250,000 tons compared to 1980.

But grain and protein feed imports for 1983 are strikingly high. With approximately 3.5 million tons of grain, 1983 grain imports are the third highest ever after 1976 (4.8 million tons) and 1980 (4.2 million tons) and with approximately 1.4 million tons of protein feed products, protein feed imports are by far the largest in GDR history, even though in 1982 and 1983 domestic grain yields amounted to more than 10 million tons (see Table 3).

Even the almost catastrophically poor root crop yields (potatoes, sugar beets) can only explain about one half of the increase in grain importation compared to 1982. The clearly higher output in livestock farming compared to 1982 could be an indication however that, while the inventories reduced under the 1982 conditions were not replenished, more concentrated feeds were probably again supplied to livestock production operations. An explanation of the rapid offsetting of the 1982 collapse could include the protein feed imports which rose to more than 1.4 million tons, the increased use of every conceivable substance which could be used as feed (including even sewage solids and silo seepage), the increased use of residual and marginal land by socialist operations and private producers as well as the success achieved in the reduction of loss of animals. Not to be ignored, however, is the fact that, as in the case of petroleum, the GDR also attempted in grain to obtain urgently needed currency through revolving door trade or reexport business, for example, by paying for Soviet oil partially with grain<sup>61</sup>.

In contrast to the agricultural yields greatly affected by the summer drought in 1982 and 1983, 1984 weather conditions--along with the structural changes introduced--enormously favored the yield situation in the GDR agrarian sector. For one thing, new GDR records will almost certainly be achieved in virtually all types of crops and livestock outputs (see Table 3); for another thing, the profit situation in agriculture will also clearly improve due to the expected overfulfillment of the plan and the effects of the reorganization of national subsidies linked to agricultural price reform (see Table 1). However, the GDR's lag in yield and productivity compared to the FRG which set in after 1945<sup>62</sup> will only be reduced insignificantly, for here also new production records are expected (with the possible exception of milk production). With regard to labor productivity, the GDR agriculture lag may even increase



further because, contrary to the original industrialization plan, the number of employees in GDR agriculture has climbed continuously since 1977 and in 1983 alone increased by approximately 11,000.

In summary, during the first 4 years of the current 5-year plan, in the face of the national economic background conditions established for it and in spite of the 1982 setbacks mentioned, a positive evolution in output can be certified for the GDR agrarian sector compared to the previous 5-year plan period (with more favorable background conditions). With the renunciation of the stalled industrialization plan of Gerhard Grueneberg, the Central Committee Secretary for Agriculture, Forestry and Foodstuffs who died in 1981, that is, with the planned regional subdividing of agricultural operations into relatively independent divisions and work teams and the "rediscovery" of the unified agricultural production process, the SED has established workable premises for greater efficiency of its socialist agriculture—at least it has attempted to jettison a portion of its troublesome ballast.

Table 1. Rough Calculation of the Profitability of GDR Agriculture and Forestry (LuF) in 1975, 1980, 1981 and 1983 (Data in billions of marks)

Item	1975 Price Base		1980 Price Base			Estimate
	1975	1980	1980	1981	1983	1984 <sup>1</sup>
LuF gross product	42.6	47.6	--	49.7	48.7	67.0 - 70.0
- LuF productive consumption	26.6	31.5	--	32.6	31.5	42.0 - 44.0
= LuF net product	16.0	16.1	16.6	17.0	17.2	24.0 - 26.0
- Taxes and levies for agri. firms	1.3	1.4	1.4	1.2	1.4	5.0 - 6.0
- Company internal investments <sup>2</sup>	3.0	2.7	3.0	3.2	1.0	2.0 - 3.0
- Calculated total wages <sup>3</sup>	8.4	9.7	9.7	10.0	10.9	11.3 - 11.5
= LuF "profits"	3.3	2.3	2.5	2.6	3.9	6.0 - 7.0

supplementary  
information:

Product-related price  
supports for agri.  
capital goods

capital goods	1.0	6.1	6.1	6.4	7.8	2.3
Subsidies for food price stability	7.2	7.8	7.8	11.2	12.1	21.0 - 23.0

1. Based on the magnitude of prices altered by the agrarian price reform and good 1984 yields
2. LuF investments minus "contributions for improvement, investment subsidies, product-related price supports and other measures to raise production" provided from the national budget
3. Based on the number of permanent agricultural workers (excluding ACZ's, plant protection and veterinary medicine), forestry workers and the average monthly labor income of full-time production workers in LuF VEB's; that means no assumed income disparities between agricultural workers and members of cooperatives

Sources: Statistischer Jahrbuecher der DDR [GDR Statistical Almanacs] (various years) and personal calculations

Table 2. Evolution of Selected GDR Agricultural Inputs--1980 to 1983

<u>Item</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
Permanent workers in socialist agriculture <sup>1</sup>	780,204	785,769	792,039	803,069
LuF subsidies (millions of marks)	5,313	5,467	5,052	4,580
LuF productive consumption (millions of marks)	(31,071) <sup>2</sup>	32,640	--	31,510
Land improvement work:				
Irrigation (in hectares)	48,240	38,456	27,692	17,329
Drainage (in hectares)	60,166	62,346	77,686	78,779
Delivery of capital goods:				
kg nitrogen/hectare of crop land	119.9	119.7	97.1	111.0
kg phosphate/hectare of crop land	62.0	59.8	48.6	53.3
kg potash/hectare of crop land	79.2	96.0	79.3	67.9
kg pesticide (active ingredient)/hectare	5.7	5.7	5.7	5.5
Tractors delivered (number of pieces) including:	5,986	6,290	4,896	--
Imports from the USSR	3,693	2,644	1,663	1,441
Combines delivered (number of pieces)	469	477	626	--
Grain imports (thousands of tons) including:	4,204	3,199	2,436	3,480
Imports from the United States	3,120	1,796	1,504	891
Protein feed imports (thousands of tons) including:	943	1,030	1,155	1,431
Inner-German deliveries	403	313	546	752

1. Excluding permanent employees in ACZ's, veterinary medicine and plant protection

2. 1975 price base

Sources: Statistisches Jahrbuch der DDR 1984; Statistisches Jahrbuch des RGW [CEMA] 1984 and other sources

Table 3. Evolution of GDR Agricultural Yields and Outputs—1980 to 1984

Item	1980	1981	1982	1983	1984 <sup>1</sup>
<b>Yield/hectare in dt</b> [1 dt = 100 kg]:					
Grain	38.1	35.7	39.8	39.7	ca. 45
Potatoes	179.7	205.6	176.3	146.2	> 230
Sugar beets	281.0	307.6	279.6	240.1	> 330
Silage corn	313.6	367.6	278.4	284.9	ca. 280
Forage crops	405.2	403.6	339.5	395.4	> 420
Meadows and pastures	287.6	297.3	275.2	304.0	> 320
-Gross land production <sup>2</sup> (dt of grain units/ hectare of crop land)	38.1	38.3	38.0	38.2	—
<b>Livestock production:</b>					
kg milk (3.5 % butterfat)/cow	3,923	3,872	3,626	3,918	> 4,000
kg butcher beef/cow	311	326	318	303	> 310
dt butcher pork/sow	12.8	13.1	12.3	13.2	> 13.2
-Overall livestock production <sup>2</sup> (dt of grain units/cattle unit)	35.8	35.4	33.1	35.2	—
<b>Production (thousands of tons):</b>					
Grain	9,626	8,863	10,021	10,067	ca. 11,500
Potatoes	9,214	10,378	8,883	7,063	> 11,000
Sugar beets	7,034	8,043	7,193	5,711	> 8,200
Milk (3.5 % butterfat)	8,321	8,202	7,678	8,203	> 8,600
Butcher meat	2,478	2,604	2,416	2,444	> 2,600
-Foodstuffs production <sup>2</sup> (dt grain units/labor input)	335	336	312	321	—

1. Personal estimate 2. According to the grain unit index of the FRG

Sources: Statistisches Jahrbuch der DDR 1984; calculations by Prof. K. Merkel (Berlin Technical University); personal calculations and (1984) estimates

# FOOTNOTES

1. Author collective, "Industriemaessige Produktionsmethoden in der sozialistischen Landwirtschaft der DDR" [Industrylike Methods of Production in Socialist Agriculture in the GDR], (East) Berlin, Dietz Verlag, 1976, p 266.
2. Author collective, "Die Landwirtschaft der DDR" [GDR Agriculture], (East) Berlin, Dietz Verlag, 1980, p 260.
3. See, among others, H. Nau, "Formation and Structural Development Trends in Livestock Production Operations," MONATSHEFTE FUER VETERINAERMEDIZIN, Jena, No 14, 1978, pp 521-524.
4. Konrad Merkel, "Agriculture and Agrarian Policy in the GDR Under Uncertainties and Risks," in "Economics and Economic Policy in the GDR Under Uncertainties and Risks," FS-ANALYSEN, No 6, 1983, pp 31-49.
5. Ibid., p 49.
6. Karl Hohmann, "Adaptation Problems of GDR Agriculture to the Overall Economic Requirements of the Eighties," in "GDR Economic Strategies for the Eighties," FS-ANALYSEN, No 8, 1981, pp 93-104, this reference: pp 102-103.
7. GBl ["Gesetzblatt" [Law Gazette]], Vol 1, 1980, No 16.
8. Karl Hohmann, "The New Economic Measures in GDR Agriculture Against the Backdrop of Previous Results of the 1976-1980 5-Year Plan," in "The GDR Economy at the Beginning of the Eighties," FS-ANALYSEN, No 5, 1980, pp 55-87, this reference: pp 66-87.
9. Ibid.
10. See also Karl Hohmann et al., "GDR: Livestock Production Operated on an Industrial Model," LANDWIRTSCHAFT--ANGEWANDTE WISSENSCHAFT, No 241, Muenster-Hiltrop, 1980.
11. H. Nau, "On the Influence of Changing Production Conditions on Livestock Production," MONATSHEFTE FUER VETERINAERMEDIZIN, Jena, No 7, 1981, pp 274-277.
12. Ibid.
13. NEUES DEUTSCHLAND, 21-22 November 1981, pp 8-9.
14. Helmut Schlieck, "Tasks for the Continuation of the Intensification of Agriculture in the Eighties to Raise Production and Efficiency," KOOPERATION, (East) Berlin, No 2, 1983, pp 67-74, this reference: p 72.



15. Kurt Groschoff et al., "On the Further Socialist Intensification and Rationalization of GDR Agriculture, Especially in Regard to Plant Production," WIRTSCHAFTSWISSENSCHAFT, (East) Berlin, No 12, 1982, pp 1797-1820, this reference: p 1804.
16. P. Tillack, "Influence of Scientific-technical Measures on Organization and Efficiency of Livestock Production Processes and Operations," INTERNATIONALE ZEITSCHRIFT DER LANDWIRTSCHAFT, Moscow/(East) Berlin, No 1, 1983, pp 13-16.
17. See also Karl Hohmann, "Agrarian Price Reform as a Productivity Stimulus?" in "Economics and Economic Policy in the GDR Under Uncertainties and Risks," Part III, PS-ANALYSEN, No 7, 1983, pp 51-69.
18. Ibid.
19. GBl Special Issue No 1114.
20. Wilhelm Cesarz, "Agrarian Price Reform Encourages Increased Performance," NEUES DEUTSCHLAND, 17 May 1983, p 3.
21. GBl Special Issues No 1171 and 1172.
22. GBl Special Issue No 1114.
23. Gerhard Grueneberg, "Continuing Fulfillment of the Plant Production Decrees of the 7th SED Party Congress," KOOPERATION, (East) Berlin, No 3, 1975, pp 97-112, this reference: p 107.
24. NEUES DEUTSCHLAND, 20 November 1981, p 5.
25. Author collective, "On SED Agrarian Policy and Alliance Policy in the Structuring of the Developed Socialist Society," (East) Berlin, Dietz Verlag, 1978, p 105.
26. NEUES DEUTSCHLAND, 20 November 1981, p 5.
27. Ibid.
28. NEUES DEUTSCHLAND, 25 November 1983, p 5.
29. Thomas T. Hartmann, "Die Kooperation in der sozialistischen Landwirtschaft der DDR" [Cooperation in GDR Socialist Agriculture], Berlin, Duncker & Humblot, 1971, (especially pp 103-142).
30. "Practice has shown that combination to form large LPG's is not suited to bringing about economically appropriate concentration and specialization." (Bruno Kiesler: "Developmental Problems of Our Agriculture," EINHEIT, (East) Berlin, No 6, 1971, pp 718 ff., this reference: p 723.

31. Vladislav Bajaja, "Organisation und Fuehrung landwirtschaftlicher Grossunternehmen in der DDR" [Organization and Management of Large Agricultural Enterprises in the GDR], Berlin, Duncker & Humblot, 1978, especially pp 38-54.
32. Bruno Lietz, "Performance of VEG's of Crucial Significance for Supplying the Population and Industry," KOOPERATION, (East) Berlin, No 1, 1984, pp 7-12, this reference: p 11; Renate Schoebl, Gert Hesse, Gerhard Schulz, "Quality Standard for Planning in the Cooperative: Increasing Output With Declining Input," KOOPERATION, (East) Berlin, No 8, 1984, pp 341-343; Heinz Zacharias, "The high responsibility for enterprise management education and research results from the demands made on socialist enterprise management." KOOPERATION, (East) Berlin, No 8, 1984, pp 357-358.
33. Helmut Schieck, "Tasks and Role of the Cooperative Farmer Class in the Continued Structuring of the Developed Socialist Society in the GDR," KOOPERATION, (East) Berlin, No 3, 1984, pp 112-115.
34. Ibid., p 113.
35. Renate Schoebl, Gert Hesse, Gerhard Schulz, op. cit., p 342.
36. Bruno Lietz, op. cit., p 11.
37. NEUES DEUTSCHLAND, 23 November 1984, p 6.
38. Bruno Lietz, op. cit., p 11.
39. Kurt Groschoff, "Cooperation--An Important Path to GDR Agricultural Development," ZEITSCHRIFT FUER DEN ERDKUNDEUNTERRICHT, (East) Berlin, No 8-9, 1984, pp 279-286, this reference: p 283.
40. Renate Schoebl, Gert Hesse, Gerhard Schulz, op. cit., p 342.
41. "As a rule, cooperative farmers and workers in the Schmoelln district exploit the same territory today as the cooperative teams or cooperative divisions for plant production of the sixties or the early seventies." (Achim Fahr, Hans Salk, Wolfgang Abloch, "Informed Management and Planning of the Unified Production Process," KOOPERATION, (East) Berlin, No 4, 1984, pp 147-149, this reference: p 148.
42. DAS VOLK, 4 January 1984, p 3.
43. NEUES DEUTSCHLAND, 23 November 1984, p 6.
44. Ibid.
45. Ibid.

46. Author collective, "Oekonomie der Landwirtschaft und Nahrungsgüterwirtschaft der DDR" [GDR Agricultural and Foodstuffs Economy], VEB Deutscher Landwirtschaftsverlag, (East) Berlin, 1983, pp 174-177.
47. Hans Dieter Schulz, "Economic Growth Sources Never Before Heard Of," DEUTSCHLAND ARCHIV, Cologne, No 1, 1984, pp 5-10, this reference: p 10.
48. NEUES DEUTSCHLAND, 20 November 1981 and 21-22 November 1981.
49. NEUES DEUTSCHLAND, 20 November 1981, p 5.
50. However, in 1980 product-oriented organization of labor was to be found in only 52 percent of plant producing operations (Hellmuth Kruepper, Werner Koehler, "Higher Yields and Efficiency in Plant Production Through Rational Organization of Enterprises," KOOPERATION, (East) Berlin, No 7, 1981, pp 296-299, this reference: p 298.
51. Ibid.
52. [Footnote omitted in original]
53. "People's Representatives Take Advantage of Stable Collective Work," NEUES DEUTSCHLAND, 19-20 June 1982, pp 5-6.
54. Bruno Lietz, "On the Further Tasks in Formulation and Application of Socialist Enterprise Management," KOOPERATION, (East) Berlin, No 8, 1984, box p 356.
55. "No Longer an Issue for a Long Time?" BAUERN-ECHO, (East) Berlin, 14 November 1984, p 6.
56. Guenter Durak, Guenther Grimmer, "Why Should the Regional Principle Become the Ruling Principle?" NEUER WEG, (East) Berlin, No 11, 1984, pp 444-445.
57. Bruno Lietz, "Better Repairs With Declining Costs," NEUE DEUTSCHE BAUERNZEITUNG (DBZ), (East) Berlin, No 50, 1982, pp 3-5 (the deadline "by 1985" in the text of this article was corrected in DBZ, No 51, 1982, p 2 to "by the end of 1983."
58. Werner Felfe, "35 Years of Successful SED Agrarian and Alliance Policy," EINHEIT, (East) Berlin, No 9-10, 1984, pp 811-817.
59. NEUES DEUTSCHLAND, 27-28 November 1982, p 4.
60. NEUES DEUTSCHLAND, 26-27 November 1983, p 4.

61. Maria Haendcke-Hoppe, "10 Years of Foreign Economic Relations and Foreign Economic Policy in the GDR," FS-ANALYSEN, No 5, 1984, pp 57-81, this reference: p 76.
62. Konrad Merkel, "Agriculture and Agrarian Policy in the GDR Under Uncertainties and Risks," FS-ANALYSEN, No 6, 1983, pp 31-49.

12666

CS0: 2300/18

CHEMICAL, ORGANIC FERTILIZERS, IRRIGATION INCREASE SOIL QUALITY

Organic Fertilizers Emphasized

East Berlin FELDWIRTSCHAFT in German Vol 16 No 8 Aug 85 pp 329-332

[Article by K. H. Braun, Ministry of Agriculture, Forestry and Foodstuffs:  
"Systematic Improvement of Soil Fertilizer--Important Link in Further Intensification of Crop Production"]

[Text] With the implementation of the resolutions of the 10th Plenum of the SED Central Committee, the cooperative farmers and workers of the LPG's [agricultural producer cooperative], VEG's [state farm] and GPG's [horticultural producer cooperative] working jointly with their production cooperation partners are, with intensified effort, aiming their competitive initiatives for the worthy preparation of the 11th SED Congress at the purposeful realization of the greater demands and standards of the new level of agricultural economic strategy which were adopted by the 10th SED Congress. Basically their goal is to guarantee to an increasingly greater extent systematic, stable supplying of our people with agricultural and animal foodstuffs and industry with agricultural raw materials from a steadily growing domestic output in crop and animal production with decreasing specific production consumption and a constantly better relationship between costs and results. The standard for this is determined by overall fulfilling and purposeful exceeding of the production and supply tasks which were set forth in the 1985 economic plan and the systematic creation of prerequisites for a high increase in output in 1986.

Requirements for Deepening Intensification That Saves Resources

To guarantee the socially essential steady increase in output and efficiency in crop and animal production the cooperative farmers and workers are concentrating their efforts in socialist competition to an ever greater degree on increasingly improved utilization of scientific-technical progress organically linked with their proven experiences in constant deepening of intensification. In this connection the priority development and intensification of crop production continues to warrant their special attention because this decisively influences the standard and also the growth in animal production output.

The requirements and standards of the 10th Plenum of the SED Central Committee for further implementation of the agricultural economic strategy set the task of systematically developing the comprehensive character and resource-saving



type of intensification and in addition applying the science factor substantially more broadly and effectively in production.

Furthermore, in this connection competent work with field-based maximum yield designs and stable-based maximum output designs has demonstrated its value because in this way, in a manner appropriate to the concrete site-based conditions, requirements and possibilities for realization, scientific-technical progress can be put into effect in a comprehensive manner in unity with proven practical experiences as a determining element in the organization of crop and animal production.

The qualitatively new requirements for the development of comprehensive resources-saving intensification of crop production, especially the requisite deepening of the integration of science and production, establish for the shaping of scientific-technical quality and complexity of the further work with field-based maximum yield designs and for the organization of the intensification process as a whole new tasks and directions which must begin to be put into practice with the autumn work for the 1986 production and plan year. In this the focus is on the comprehensive application of those measures of scientific-technical progress and proven farmer practice which--result in the best possible use of the free power of nature and existing social, natural and economic production conditions, in particular through suitable site distribution of production, shaping cultivation and rotation with the goal of maximum utilization of the available growing season for biomass production.

--in the process of deepening cooperation, contribute to maximum development of the internal resources of the uniform reproduction process of crop and animal production,

--promote use of the available resources which is more efficient in respect to yields and reducing production consumption, in particular the assets for mechanization, fertilizing and crop protection, and

--support better utilization of the biological output potential of the plants and crops.

A decisive key in developing these intensification potentials for increasing yields per hectare with decreasing specific production consumption continues to be the complete and intensive utilization of our soil resources, systematic improvement of its fertility and its yield-effective use through a high standard of farming and implementation of crop-based scientific production methods.

#### Comprehensive Development of Soil Fertility--Important Link in the Further Intensification of Crop Production

As the primary production means of agriculture the soil and its fertility is not only the objective basis of crop production. Because of its fertility characteristics, especially its storage and transformation capability for nutrients and water, its microbiological activity, phytosanitary control capability and its technological management characteristics our soil has a heightened function in the process of developing yields. These fertility characteristics can,

with systematic management of the soil for steadily increasing production output from the soil, be reproduced on an expanded basis. However, because of natural and management based reasons the fertility characteristics of our soils are differentiated in their level. All this justifies the systematic improvement and utilization of the fertility yield potential of the soils as one of the most important links for deepening resource saving intensification.

As a result of the active work with long-term programs of efficient soil use in the production cooperation groups in crop and animal production and in the territories of the kreises and bezirks increased efforts to develop soil fertility were put into effect in the 1981-1985 Five-Year Plan period.

As key issues they are expressed in a 30-percent increase in the volume of organic material for the soil, in the improvement in the nutrient supply of the soils, the expansion of irrigatable soil resources on over 1 million hectares, the introduction of improved technology and processes for soil cultivation of appropriate quality, broader application of scientific rotation, among many others, which for their part are involved in the increase in output in crop production which has been achieved.

In evaluating the results and experiences to date in implementing the long-term programs of efficient soil utilization and our advancing knowledge in soil fertility research it is furthermore necessary to develop, in accordance with the resolutions of the 10th Plenum of the SED Central Committee, the factors of intensification even better in their complexity and to consistently focus them on steadily improving the yield capability of the soils.

This higher level of quality in the management and planning of comprehensive soil fertility development requires the systematic application of the "Comprehensive Methods for Improving Soil Fertility and Yields," which were developed and positively tested by agricultural science and the gradual use of which on over 3 million hectares of agricultural land is being started in 1985.

Their introduction involves field-based use of site characteristics in terms of the features of medium scale site mapping, the determination of desired and actual values with respect to essential soil fertility indexes, the derivation of effective combinations of cultivation/crop and soil improving measures from the desired/actual value comparison for the duration of at least one crop rotation cycle and the field-based documentation of basic site data, the desired and actual values of soil fertility indexes and coordinated soil fertility measures, which are planned for the medium term, in the new field map 1 in the context of the EDP-oriented field index.

With the use of comprehensive methods for improving soil fertility crop production can be started in every LPG and every VEG using published instructional materials and the introduction of field map 1 which can be ordered from the Agro-Chemical Investigative Advisory Service (ACUB). The majority of the actual values for analyzing the state of soil fertility can be taken from the ACUB's soil study results. Some soil fertility indexes, as for example surface and topsoil depth, duration of excessive moisture, resistance to penetration, can be determined in the LPG's/VEG's themselves or in cooperation with the facilities

for crop protection (nematode population). As the Altenburg, Wriezen and other agro-chemical centers [ACZ] show, the ZBE [interplant facilities] of ACZ with scientific technical groups can give effective support to their LPG's/VEG's with scientific-technical studies and expert opinions and other work in respect to introducing comprehensive methods for increasing soil fertility. Essential is the knowledge that their use, in contrast to traditional combined soil fertility measures, represents a fundamentally new quality in the scientific control of the soil fertility processes. Thus, their use according to regulations requires fulfilling minimum requirements which relate to substance and method, in spite of proceeding gradually. These requirements consist in the field-based determination of desired and actual values for the soil fertility indexes, crop rotation planning, the derivation of effective combinations of cultivation, crop and soil improving measures and in the precise use of newly developed field map 1.

Classifying, balancing and implementing soil fertility measures which are differentiated by field must be guaranteed by enterprise and working season planning. Through agricultural science a flexible computer-supported information and advisory system for the efficient medium-term and operational management of the soil fertility processes and their use for rising yields in the next few years is being developed and tested; it will put the LPG's and VEG's in a position to control even better the diverse elements of soil fertility development in their various interrelationships, to utilize available resources economically and efficiently and to develop combined effects.

#### Increased Supplying of Soils with Organic Material

Furthermore, in the comprehensive program of soil fertility measures the greatest importance attaches to the full utilization of all reserves for increased addition of organic material into the soil in accordance with the requirements of crop-rotation and field-based humus balances. The key importance of this factor stems from the fundamental role of organic material for improving essential fertility characteristics of the soil and for the growing proportionate of the increasing requirements for macro- and micronutrients from industry-specific sources.

Furthermore, in spite of the progress achieved in the past few years in supplying soils with humus, intensive efforts are essential in all production cooperation groups, especially in Neubrandenburg, Suhl and Frankfurt Bezirke. This is due to the fact that the deficit in respect to universal guaranteeing of the expanded reproduction of organic material in the soil is currently on the average at 2.6 dt [1 dt = 100 kg] ROS/hectare AL, more than 15 percent of the requirements of expanded reproduction. The calculation of field-based humus balances in all Bezirke for the past 4 to 8 years points moreover to the fact that there is a record of a high degree of unevenness in the humus reproduction of the fields. Thus, there are approximately 45 to 50 percent of the fields with a below-balance supply in contrast to 25 to 30 percent with an above-balance supply. That is a serious obstacle for balanced fertility development of the fields and one of the causes for the existing unjustified yield differences between fields in the enterprises. Thus, in the future, beyond the systematic expanded reproduction of the annually mineralized organic soil, the result will be more



extensive cultivation requirements for obtaining and adding organic material to the soil in connection with specifically overcoming humus-impooverished fields and field sections. The effective use of available organic fertilizers in accordance with cultivation criteria is achieved wherever planning for the use of organic fertilizing is based on the requirements of crop rotation- and field-based humus balances and the measured OS [organic material] content of the soil and wherever partial field-based organic fertilizing is organized in a consistent manner.

To develop more organic materials for the soil efforts must be directed even more decisively at:

--maximum production, low-loss storage and the efficient use of stable manure and liquid manure that is rich in dry substance with more effective use of enterprise operational instruments, such as a brigade plan, predetermination of normative standards, socialist competition, comparison of output, material stimulation in the crop and animal production collectives which are involved,

--even better utilization of the possibilities for the expanded cultivation of multiyear feed legumes and root-intensive undersown crops, especially orchard grass underseed in crop rotations which emphasize grain.

--the conscious utilization of straw which is not needed for feed and storage purposes, for systematic and qualitative straw fertilizing or the production of straw-liquid manure fertilizer which is used in several kinds of processes depending on the local conditions, for example in the numerous production cooperation groups in Schwerin, Magdeburg and Potsdam Bezirke,

--expanding the production of organic fertilizers from suitable organic waste products and natural substances with systematic expansion of specialized capacities for the production of organic fertilizers. Larger reserves for this can be developed with increased extracting of lake and pond sludge, suitable household garbage and other organic waste products of the economy which to date have not been utilized.

In actual practice several solutions are of demonstrated value for increased production of stable manure, as for example

--in the Dahlenwarsleben production cooperation group, Wolmirsted Kreis, the use of the deep cowyard principle for a part of the pasture animal herds during the months they are penned up,

--in the production cooperation groups in Brandenburg Kreis the interspersing of advance waiting yards and cattle tracks in pasture areas,

--in the Premslin production cooperation group, Perleberg Kreis, the continuous production of straw-liquid manure fertilizer in solidly built leakproof storage sites. The Premslin process for producing straw-liquid manure fertilizer is characterized by the efficient utilization of rather large straw reserves which accumulate and store straw with reduced utility value, and liquid manure rich in dry substances with relatively modest demands on liquid manure transport equipment, better time utilization of stable dung spreaders and in general soilsaving production of organic fertilizers.

The experiences of many advanced production cooperation groups show that the systematic expanded reproduction of the organic material in the soil, especially the organization of a balanced forage growing structure which promotes soil fertility, the use of straw and the stable dung and liquid manure industry, must be firmly included by the production cooperation group councils in the management, planning and control activities of the uniform reproduction process of crop and animal production.

In this connection, the joint identification of stable sectors of organic fertilizer and coarse fodder production around animal production sites in connection with the shaping of site-specific crop rotations is of proven value. In many production cooperation groups the advantageousness of the goods-money relation is of demonstrated value in the stable dung and liquid manure industry. With its help the production cooperation group partners are materially stimulated to high-level and stable production of stable dung and liquid manure rich in dry substances with high quality and the lowest storage losses and transport costs. They provide quantitative proof of essential substance management relations in the uniform reproduction process of crop and animal production and also the supply, in terms of normative standards, to fields of stable dung or liquid manure according to fertilizing plan. Contractual and economic relations in the stable dung and liquid manure industry are thus an indispensable instrument for increasingly better perception of the joint responsibility of crop and animal producers for the development of the humus supply and the fertility of their soils.

#### More Attention to Structure-Protecting Soil Cultivation and Management and Elimination of Increases in Damage

The 10th Plenum of the SED Central Committee reaffirmed that even greater attention must be paid to structure-protecting soil cultivation as an important factor in soil fertility and resource-saving intensification.

Approximately 25 percent of the total consumption of diesel fuel is linked to soil cultivation measures. This is a binding reason to utilize every opportunity to save diesel fuel with simultaneous protection of the structure of the soil without permitting cutbacks in cultivation requirements.

For this purpose the following must be implemented as the important directions:

--expanded use of combined seedbed preparation aggregates and plowless cultivation of winter grains after root crops,

--guaranteeing differentiated depths for plows and cultivation in accordance with the requirements of the crops and the condition of the soil in the context of crop rotation,

--expansion of stubbing plowing and stubble working, primarily on grain fields with heavy weed growth and

--more consistent use of technical and organizational opportunities for lowering soil pressure, especially better observation of permissible soil moisture with



cultivation measures and more consistent use of twin tires, track looseners and other measures that protect the soil.

A key issue continues to be further improvement of agrotechnical discipline and the quality of all field jobs. Improving the quality of work in all field jobs must be universally supported by the predetermination of field-based normative standards in line with the designs for maximum yields, recognition and awards based on quality, moral stimulation of quality work and the effective guiding of socialist competition between department collectives, brigades and machinery operators.

In addition, in the LPG's, VEG's, GPG's and at the kreis level there must be substantially more effective management of the competition for the title "Best Machinery Operator," "Collective of Distinguished Quality Work in Agriculture," and "Enterprise of High-Quality Agriculture".

According to estimates by agricultural science, on 1.8 million hectares of farmland we have more frequently occurring increases in damage which appear in increased number on sections of D-sites and on a limited scale on Loe-, Al- and V-sites. At present increases in damage are frequently underestimated on D<sub>1</sub>- and D<sub>2</sub>-sites.

Overall we proceed on the assumption that in the future the diagnosis of increases in damage and the elimination of proven increases in damage by site-specific methods of topsoil base and subsoil cultivation must be firmly integrated into the comprehensive program of the essential cultivation tasks, the working season and energy source balance sheets and must be implemented at the fixed agrotechnical times. In general it is true that soil loosening need only be done on areas with demonstrated increases in damage as a result of probes in sandy soils and of structural diagnosis in binding soils. As a rule these are only partial sections of fields, in particular heavily travelled headlands, crossings and in part depressions with fine soil particles which have been brought in.

In order to keep the necessary energy-intensive subsoil loosening requirements as low as possible, in the future the chief hallmark of soil pressure reduction, the implementation of cultivation and soil-improving measures to reduce soil pressure sensitivity and the support of biological processes to regenerate the soil structure must also apply.

#### Systematic Expansion and Efficient Utilization of Irrigating and Draining

Based on the fundamental importance of water as an intensification factor to increase and stabilize crop production, efforts for expanding and rebuilding irrigation facilities, primarily by simple irrigation measures, must be systematically continued on the basis of the irrigation programs which have been adopted.

To do this, the mass initiative in villages and cities as well as in all LPG's, VEG's and GPG's must be comprehensively developed with broad organization of youth projects. Priority must be given to irrigation plants for vegetable and intensive fruit growing sites which at the moment cannot be irrigated. By the

11th SED Congress 250,000 additional hectares with irrigation are to be built or rebuilt.

Using integrated investments and resources, draining waterlogged areas, improving pasture land in particular and draining wet spots must also be continued on fields using solutions which to the greatest possible extent save material and investments. Proper repair and maintenance of drainage ditches, irrigation and drainage facilities must be totally guaranteed. This requires further deepening of cooperative collaboration by the soil improving cooperatives with their LPG's and VEG's to develop capacities of the crop production enterprises to improve maintenance during periods when there is less work with systematic use of workers from the improvement cooperatives at peak work times in crop production.

To maintain the fertility and usability of the flat marshy areas which are in use and for their further intensification it is also necessary in the next few years to substantially expand the application of the efficient process of the deep plow-sand cover crop in the context of the systematic development of soil improvements.

At the same time efficient use of the irrigation and drainage facilities which were set up must be implemented with operational and state management activity because only then will the outlays result in intensification effects and higher yields.

All activities for systematic improvement of fertility and yield capability of the soils in implementing the resolutions of the 10th Plenum of the SED Central Committee will contribute to creating stable bases for socialist intensification for its long-term continuous development in order thus to be able to successfully continue in the long run our policy which is aimed at the welfare of the people and maintaining peace.

#### Crop Yields Analyzed

East Berlin FELDWIRTSCHAFT in German Vol 26 No 8 Aug 85 pp 332-34

[Article by Dr K. Ressel, J. Mangelsdorf, Lindenberg Crop Production VEG; Dr B. Grafe, Muencheberg Research Center for Soil Fertility, GDR Academy of Agricultural Sciences: "Comprehensive Methods for Reproduction of Soil Fertility --Component of the Field-Based Maximum Yield Design in the Lindenberg Crop Production VEG"]

[Text] Work with field-based maximum yield designs is an element of management activity in the enterprise and a type of creative involvement of all working people in preparing for production, implementation and evaluation.

The development of field-based maximum yield designs by groups of specialists under the direction of someone responsible for crop types has demonstrated its value. Practice shows that it is essential to give increased consideration to the demands of expanded reproduction of soil fertility. Therefore, combining comprehensive methods for reproduction of soil fertility with the measures to

guarantee cultivation in line with normative standards of individual crops including crop supervision and management turned into a pressing requirement. A decisive basis for the further continuous increase in yields is seen in this.

#### **Integrating Comprehensive Methods in the Management Process**

A high level of soil fertility is a prerequisite for high efficiency of producers. Analyses of the differentiation in yields between the fields confirm that productive varieties, optimum observance of schedules and measures of crop management can only then be made fully effective. Measures to improve soil fertility are planned on the basis of the field. The new field map 1 "soil fertility" serves as a basis for documentation.

The normative standards of field map 1 comprise the obligatory basis for shaping cultivation, seasonal working plans for soil cultivation, mineral and organic fertilizing and measures of agro- and hydromelioration.

The enterprise commissions have been decisively involved in developing field-based combinations of measures. The preparation for decisions is in the hands of a newly established structural unit of the VEG, the Department of Science and Technology. In this collective which is managed by an agronomist, trained skilled cadres for crop protection, fertilizing TKO (technical control organization) and seed preparation join together. This department is directly under the production manager and guarantees scientifically grounded production preparation. But it also has operational jurisdiction.

The range of tasks of the department include direction of field map 1, organization and implementation of the determination of soil fertility indexes, crop stand control and pest surveillance, preparation of crop management, control over maintaining the system to guarantee quality and analyses of the reasons for differentiated yields between the fields.

This collective is responsible for implementing in a highly responsible manner the experiences of the working people and scientific-technical progress jointly with those responsible for crops and the department heads of the enterprise.

#### **Use of Comprehensive Methods**

The first step in the use of comprehensive methods was a basic analysis of the quality of the soil resources, the site designation of each field. Grouping fields with like natural conditions into four rotation groups. Biologically, technologically and economically favorable crop rotations were developed which have been consistently implemented since 1982.

Carefully directed control of the development of soil fertility became possible only through knowledge of soil fertility indexes (BFK). They were a prerequisite for correct assessment of the measures and combinations of measures.

The BFK for all fields were completely available with the rotational soil study by the Agro-Chemical Investigative Advisory Service (ACUB) in 1984. The BFK for topsoil depth, increase in damage and excessive moisture were determined by the enterprise itself.

## Supplying Soils with Organic Material

The expanded reproduction of the soil's organic material is the most important measure for improving soil fertility. The BFK for organic soil material (OBS) and the crop-rotation and field-based humus balances serve as the measuring basis for organic fertilizing. The BFK for OBS is used to expand poor areas which are supplied with additional quantities of organic material.

The humus balances are used to calculate the amounts of fertilizer to be systematically applied in the course of the crop rotation.

For all crop rotations they show expanded reproduction of the organic material of the soil. According to the results of the soil study substantial differences in the BFK for OBS can be established between the fields and between the sampling areas of a field.

On underprovided fields and sections of fields, especially straw, compost and peat are used in addition to the specific application of fertilizer.

In the future our efforts will be focused on the following key issues:

- balancing the differences in levels in respect to the status of supplying,
- increasing the yield of stable manure and low-loss use of all organic fertilizers of animal production,
- maximum intermediate crop growing,
- appropriate quality of straw fertilizing together with green manuring on fields which are quite far from stables,
- increase use of activated peat.

## Expanded Reproduction of Soil Nutrients

The results of the last round of the systematic soil study show clear differences in the content of macro- and micronutrients, lime and organic material not only between the fields, but also between sampling areas of a field (Figure 1).

Especially in respect to phosphorus and copper the share of fields which are not in the desired value range is still too large. Reducing the differences in the supply level was an urgent task. Together with the Beeskov ACZ in 1984 partial field-based green manuring was prepared and realized. The director of operations of the fertilizing brigade received a field sketch (Figure 2) which clearly showed the different values per field section. This approach requires intensive preparation for work and documentation of the measures which must be guaranteed by the science and technology working group.

## Structure-Protecting and Energy-Saving Soil Cultivation

Varying plow depth and seedbed preparation with the fewest possible operations with optimum use of tool and equipment combinations are a fixed part of the field-based maximum yield designs. Avoiding severe soil pressure warrants



special attention. Progress in this connection is demonstrated by attention to soil condition, driving outside the furrow when plowing with the K 700, the use of twin-tire tractors when preparing the seedbed, the construction of drive-ways, avoiding traversing the field unnecessarily and the construction of additional approaches to the road. We are increasingly oriented toward measures such as plowless cultivation of winter rye following potatoes or the combination of plows, seedbed preparation and sowing of small-grain intermediate crops in one operation. In 1983 and 1985 we were able to cultivate all the winter rye fields after potatoes without using the plow.

Samples with the hand pressure probe showed that increased damage to the subsoil of our fields is substantial. We have decided in favor of two different ways to eliminate such increases: loosening the soil in combination with plowing and partial deepening of the topsoil on sections of fields with the B 246 A.

#### Operative Regulation of Crop Development

An essential element in our maximum yield designs is the system of guaranteeing quality with firm regulations on crop supervision and crop management. Starting with planting every field is under constant observation. This process works best with grain.

In weed control we follow the principle of using effective control operations in the crop rotation in order to make economic use of chemical agents and mechanical means. Especially in controlling orchard grass we shift the time of control to the period between harvest and growing the intermediate summer crop. This requires extremely high effectiveness of the technology.

Together with the responsible department heads and the individuals responsible for the crops the department for science and technology coordinates the work with the ACZ and directs the comprehensive programs of the ACZ so that all mineral fertilizing and plant protection measures, the use of airplanes and in part organic fertilizing are directly managed and organized by this department.

#### Discovering Reserves By Analyses of Yield Differences

Extensive crop and field-based analyses and comparison with best values are the main content of the constant refining of our maximum yield designs. This work is handled jointly by the individual responsible for crops and the department of science and technology.

Important in this is consideration of factors of soil fertility and the element of crop management. In the case of winter rye the highest yields were reached whenever all BFK were in or near the desired value range, nitrogen was correctly measured and the crop could be kept healthy throughout the entire growing season. Lesser yields are noted particularly on fields where several BFK desired values were not achieved.

We have assessed and tested the work of the past few years for putting the maximum yield designs into operation. The results show that with consistent use of the measures to improve soil fertility and high agronomic discipline, the average yield level can be increased annually by at least 1 CE [grain unit]/hectare. Implementing field-based maximum yield designs is a priority obligation



for the entire enterprise collective. It is the way to achieve the necessary increase in yields in the next few years and to accommodate the demands of the 1980's in crop production.

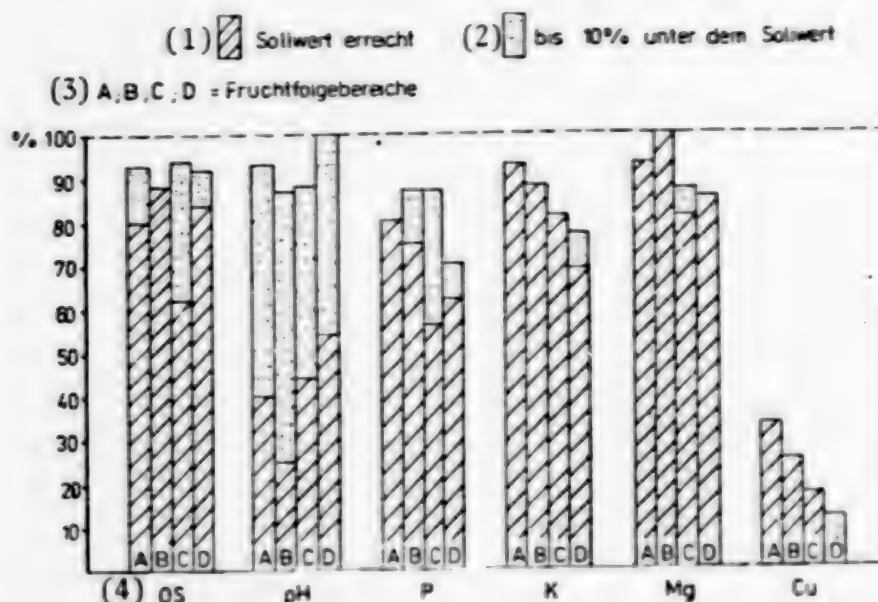


Figure 1. Percentage Share of the Fields That Achieved the Desired Value or Were Only Up to 10 Percent Below

Key: (1) Desired value achieved  
 (2) Up to 10 percent below the desired value  
 (3) A;B;C;D = crop rotations  
 (4) Organic material

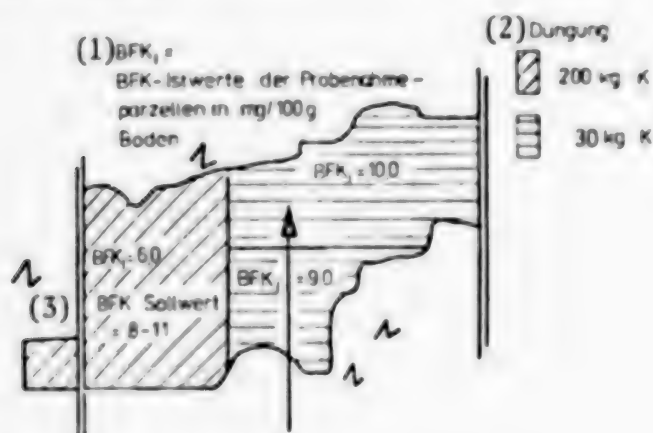


Figure 2. Partial Field-Based Fertilizing, Exemplified by Potash

Key: (1) BFK<sub>1</sub> [BFK = soil fertility index] (2) Fertilizer  
 = BFK-actual values of the sampling plots in mg/100 g of soil

FALL PLANTING GUIDED BY ANALYSIS OF 1985 PLANTING SEASON

East Berlin BAUERN-ECHO in German 4 Sep 85 p 6

[Interview with Dr Dieter Ebert, professor and sectional director at the Institute for Grain Research, Bernburg-Hadmersleben: "Analysis of the 1985 Growing Year--Guideline for Fall Planting"]

[Text] Winter barley produced the highest average yields to date this year. Previously the best years were 1974 (47.4 dt [1 dt = 100 kg]/hectare), 1983 (46.5 dt/hectare) and 1984 (48.2 dt/hectare). But it was also clear that in the past few years winter wheat yields were higher than those of winter barley. That reversed itself again in 1985. In addition to a high yield potential (in 1985 with individual outputs of 100 to 110 dt/hectare in field tests) the winter variety of barley which is used exclusively as feed grain also has several labor management advantages which justify its cultivation in almost all production regions of our republic. On the other hand, however, winter barley also makes relatively high demands on growing technology if areas in the production process are considered, such as a short planting season, wintering, pest infestation, stability and short threshing period. Thus it is repeatedly necessary to critically examine the maximum yield designs for winter barley and design them in the most detailed manner possible; this must reflect all the experiences to date and the latest scientific-technical findings. The statements--succinctly related to measures in the fall--should provide insights to this.

[Question] What were the chief reasons for the good yield formation with winter barley in 1985?

[Answer] Because of the late completion of the grain and straw harvest of wheat in 1984--particularly in the southern bezirks--it was possible to stick to the optimal time for planting winter barley for 60 to 70 percent of the crop. But it turned out to be advantageous that September 1984 brought, with good distribution, 30 to 70 percent above average precipitation with relatively favorable temperatures. These conditions promoted rapid settling of fields which were plowed relatively late and also even germination of the seedlings. At the beginning of October the winter barley "was established" in the ground and by the first 10 days of November (= 5 weeks) good prewinter development was possible.

The gradings of weeds which were done in the fall confirm that in the case of problem weeds successes were achieved which ranged around the average of the past few years, involving fields worth controlling, with 34 percent in the case

of catchweed, 25 percent with corngrass and 72 percent with chickweed. The fall application of herbicide was implemented on a broad scale with a high degree of effectiveness.

Thus, as favorably as the prewinter development went, the situation became critical then in the winter. While the January frosts were not able to damage the winter barley because of a good snow cover, the 12-day cold spell in February was extremely hard on the plants. Soil upheavals and "winter-affected" crops in the central bezirks came as a result of this. But at the end of the winter it was a widespread fact that the winter barley plant had lost the majority of its leaves--often down to the still green "heart leaf." In view of such negative developments there was at this time a very pessimistic outlook for development and yield.

But the grain specialists in the crop production enterprises reacted successfully with specific measures. In general, it can be said that the development of "one-leaf plants" into "high yield plants" in the case of winter barley in the 15 weeks of the growing season in 1985 is extensive and extremely convincing proof of how grain can be positively influenced in its yield formation by expert crop management.

Thus, for example, the winter barley crops were supplied early with relatively high doses of nitrogen. In several instances a herbicide was applied a second time producing chemical weed control on a total of 133 percent of the land under cultivation. A relatively intense and early attack on winter barley with stalk breakage was stopped primarily in the southern bezirks with a fungicide spray. The mildew infestation remained under control; but here, too, fungicides were used when the standard control limits were reached.

The winter barley tillered very well, favored by the April weather (very changeable temperatures with normal precipitation), and the second dose of nitrogen promoted additional growth without any delay due to dryness. Camposan was used on 22 percent of the winter barley fields with more or less consideration of the major criteria variety, growth density, the beginning of spring and climatic water balance.

As every year camposan effected a reduction in stalk length and improvement in stability, but not positive yield reactions in every case. Thus, once again a fundamental statement in "Current Advice on Using Stalk Stabilizers" (BAUERN-ECHO No 82, 8 April 1985) is quoted: "Camposan should not be viewed as a production-technical standard measure for winter barley, but is rather to be used as an intensification factor primarily when all normative cultivation and crop standards have been observed and the treatment contributed to guaranteeing the yield through improving stability."

Also decisive in respect to yield was the fact that there was no lengthy June dry spell and the relatively cool weather in this month permitted slow maturation of the winter barley. Maturity for the harvester-thresher was somewhat slow in coming and in the first harvesting operations in part ripe grain was not accompanied by fully ripened straw. Thanks to good preparation for the harvest the harvesting-threshing began with full intensity when threshing

maturity was reached and resulted in a rapid end to this part of the harvest with predominantly favorable harvesting weather, combined with relatively very modest harvest losses.

As an end result the good grain yield of 1985's winter barley came as a result of normal to high crop densities (ears/m<sup>2</sup>), basically very good grain masses (TKM) with normal to slightly below average grain count (grains/ear). This determination is numerically confirmed by the Bernburg field test example.

[Question] What has been learned from this in respect to establishing good initial crops of winter barley for the 1986 harvest year?

[Answer]--The main preliminary crop for winter barley is winter wheat. Depending on the interval from "stubble removal to planting date" wheat loss is controlled by shallow plowed furrow (sprouting principle) just as effectively as with an immediate seed furrow (burying principle). The latter method will be suitable this year primarily in the southern bezirks given a late wheat harvest.

Since the wheat hardly stayed the prerequisite for a relatively flat plow furrow for winter barley can be created by short stubble. This saves time and diesel fuel in cultivating the soil. On fields that have been properly shallow plowed there is almost always success in getting a field ready for planting in one operation using B 550 and the B601 reworking equipment, especially on light average soils. Anyone who can provide peas or early potatoes as a preliminary crop will be in a position to create good sprouting and developing conditions given a normal amount of precipitation even with unplowed cultivation of winter barley.

--In respect to the choice of variety departmental recommendations provide useful tips. For every cultivated area several varieties which are equivalent in terms of yield are available for growing, but different degrees of winter hardiness and disease resistance must not be overlooked. Just as two legs are better than one, several varieties should also be planted.

It should also be kept in mind that in the current assortment of winter barleys only "Friberga" represents an ear type. All other varieties realize their grain yield via good crop formation.

--This fact also has an effect on seed strength. In the case of the high TKM of this year's seed stock the measurement of the seed strength must absolutely be determined in advance using the familiar seed formula of "grain/m<sup>2</sup>." Assuming wheat as a preliminary crop, good germinating conditions and normal seedtime, with today's varieties about 310 grams/m<sup>2</sup> +10 percent are adequate to accommodate site conditions. Once again reference should be made to the experience which was confirmed especially in 1985: thinner stands can be well managed, too dense stands must be destroyed!

--In respect to seedtime there is still the requirement to avoid early sowing. The yellow dwarfing virus is not dead! Depending on the area being cultivated winter barley is planted between 12 September and 25 September. This is 13 calendar days, but only 8 to 9 fieldwork days. Thus anyone with 800 to 1,000 hectares of winter barley to plant must be able to handle 100 hectares per day. This requires effectiveness and good management.

--Since intensive use of chemicals is also characteristic of the production method for winter barley in addition to wheat it is strongly recommended to build guideways and vehicle paths. Distances of 18.4 m are sufficient to guarantee positioning for all field jobs and also the vehicle path for essential jobs using chemicals.

--In the course of crop management we should not forget to count and record germination density which in terms of method is relatively simple to determine.

The attention of the specialists must then be directed toward weed development. As a rule an application of herbicide is necessary after the appearance of the third leaf if this was not already done in the preliminary work.

--In general additional activities in the winter barley fields are not necessary then. Fall doses of nitrogen for the seed have turned out not to be suitable in numerous field trials. The danger of overgrowth and the associated reduction in frost resistance is not inconsiderable. Attacks of stalk breaking are recorded, but control is not worth while until spring when the pests become active. Of course, if there is a heavy infestation of mildew then an application of fungicide in the fall is in order. Mention must also be made of the fact that as a result of the necessary overall observation of the flight and infestation of the leaf louse an application of insecticide can be made.

12124/7051

CSO: 2300/539



# GUIDE, TRAVEL LANES DEEMED PRACTICAL IN FERTILIZER APPLICATION

East Berlin FELDWIRTSCHAFT in German Vol 26 No 6 Jun 85 pp 244-47

[Article by Dr. R. Otto, Dipl.-Agr.-Ing. O.-A Lubadel, Institute for Cereal Research, Bernburg-Hadmersleben, of the Academy of Agricultural Sciences of the GDR; Dr. H.-O. Braune, VEG Plant Production, Schwaneberg; Dipl.-Landw. S. Troger, LPG Plant Production, Thiessen]

[Text] With increasing intensification of the cereals production a frequent traversing of the grain fields with fertilizer spreaders and plant protection machinery as well as for the mechanical cultivation is unavoidable. Not all of these measures can be carried out with airplanes. Investigations have shown that to some extent fields of growing grain are driven over six to eight times. In order to be able to carry out in this case the required measures very effectively and to keep the damage to the plants as small as possible, the use of guide and travel lanes have proven themselves for years now in numerous LPG [agricultural producer cooperatives] and VEG [state farms]. Above all in the plant raising centers with the highest cereals harvests the installation of travel lanes belongs among the permanent components of the production process.

## Advantages from the use of travel lanes

- Travel lanes make possible the assurance of a high quality of the following agrotechnical labors whereby the working widths during the fertilizer spreading or during the application of pesticides can be kept with precision. Spots getting double doses and spots getting none are avoided.

Investigations in practical operations led to the finding that without the use of the corresponding orientation possibilities only in 17 to 20% of all the cases were the working widths kept with precision (Fig. 1). In the case too of the installation of guide or travel lanes, respectively, the complex utilization of several fertilizer or pesticide machines, respectively, is provided without difficulties.

- Very significantly it appears that only through the use of travel lanes is the application of agrochemicals in the advanced stage of plant growth of the cereal possible. This acquires great importance with the application of Camposan on rye and winter barley or the spraying of fungicides for the

Table 1. system of units of measure used with the installation of travel lanes

		<u>Optimum Variant</u>	<u>VEG (P) Schwaneberg</u>	<u>LPG (P) Thiessen</u>
Installation width (track separation)	m	18.40	9.00	18.40
Track gauge	mm	1,800	1,500	1,950
Track width	mm	360	380	360

control of mildew or rusts on wheat. The experience gained in 1984 has confirmed this very clearly.

• By keeping the lanes free, under consideration of the distance between rows, a theoretical yield loss of 5.4% results from a travel lane distance of 9 m or one of only 2.7% with a travel lane distance of 18 m. It could be shown in experiments that the actually resulting loss in yield in the case of repeated use of the travel lanes is significantly smaller than in the case of indiscriminate traversing of the field. Moreover with the carrying out the fertilization measures to improve quality and the reduction in injury to plants it is more than compensated for. In any case according to timing and frequency of the applications, an average yield increase of 1 to 2 dt/ha grain can even be expected.

Additional advantageous effects can be obtained with

- the reduction of the portion of the field surface driven over,
- the limitation of the sickly portion in contrast to the traversing of the field without tracks,
- the better possibilities for orientation using an airplane, threshing combine (edge bevel), as well as stubble removal followed by PK fertilizer.

A disadvantageous side effect of the travel lanes, especially for the following crops, can be the formation of injurious packed earth in the area of the tracks when the soil being traversed is too moist. Accordingly, attention must be paid during the choice of machines to the fertilizer loading and the timing of the application.

These positive effects as a whole have led to the fact that the number of centers, which use the directional aids in the grain fields (especially the travel lanes, however), has risen constantly over the past years. Among the centers with good experience in this area the VEG Plant Production Schwanebert, Kreis Wanzleben, and the LPG Plant Production Thiessen, Kreis Rosslau, can be counted.

Table 1. system of units of measure used with the installation of travel lanes

		Optimum Variant	VEG (P) Schwaneberg	LPG (P) Thiessen
Installation width (track separation)	m	18.40	9.00	18.40
Track gauge	mm	1,800	1,500	1,950
Track width	mm	360	380	360

control of mildew or rusts on wheat. The experience gained in 1984 has confirmed this very clearly.

• By keeping the lanes free, under consideration of the distance between rows, a theoretical yield loss of 5.4% results from a travel lane distance of 9 m or one of only 2.7% with a travel lane distance of 18 m. It could be shown in experiments that the actually resulting loss in yield in the case of repeated use of the travel lanes is significantly smaller than in the case of indiscriminate traversing of the field. Moreover with the carrying out the fertilization measures to improve quality and the reduction in injury to plants it is more than compensated for. In any case according to timing and frequency of the applications, an average yield increase of 1 to 2 dt/ha grain can even be expected.

Additional advantageous effects can be obtained with

- the reduction of the portion of the field surface driven over,
- the limitation of the sickly portion in contrast to the traversing of the field without tracks,
- the better possibilities for orientation using an airplane, threshing combine (edge bevel), as well as stubble removal followed by PK fertilizer.

A disadvantageous side effect of the travel lanes, especially for the following crops, can be the formation of injurious packed earth in the area of the tracks when the soil being traversed is too moist. Accordingly, attention must be paid during the choice of machines to the fertilizer loading and the timing of the application.

These positive effects as a whole have led to the fact that the number of centers, which use the directional aids in the grain fields (especially the travel lanes, however), has risen constantly over the past years. Among the centers with good experience in this area the VEG Plant Production Schwaneberg, Kreis Wanzleben, and the LPG Plant Production Thiessen, Kreis Rossau, can be counted.

## Use of travel lanes in the VEG Plant Protection Schwaneberg

Of the numerous combination possibilities that are derived from the most varied systems of measurements for working widths and travel lane distances, the most favorable combination (Table 1) specific to the operation in the VEG Plant Production Schwaneberg have been selected. Since a large part of fertilizing and pesticidal operations is carried out on the farm itself, the decision was made for travel tracks (travel lanes) 9.0 m apart. With this the passable operation was assured for the ridge drill A202 in the coupling with the fertilizer spreaders D385 and D028/4 as well as the pesticide applicator K20/18 (S2000).

For all types of crops with the installation of travel lanes a track gauge of 1,500 mm is binding since sugar beets are not planted and the row width for potato fields is the determining factor. Besides, the operation of the truck W50 LAZ for plant protection and fertilizer applications is excluded. Otherwise a track gauge of 1,800 mm would have to be considered. This is primarily the case too on farms with a more intensive sugar beet cultivation.

The selected track gauge of 1,500 mm in the VEG Plant Production Schwaneberg was adopted in the highest yield plan for all crops. Only a few special cultures have been eliminated for which it was not possible to adapt this track gauge.

The travel lanes are generally laid upon the grain fields during the crop cultivation in order to be able to work next spring with a unified system. It was found that a stepwise introduction of the travel tracks only to individual tasks or to individual types of grain does not lead to the proper success, but a conversion to a single system as much as possible should be carried out immediately in the whole area of responsibility.

With the choice of a track distance of 9 m the VEG was also placed in a position of installing the travel tracks without the corresponding technical additions, such as travel track switches. Also it is unimportant from an organizational point of view in this case whether during the sowing the work is done with a ridge drill or in the complex.

Furthermore the decision on whether the nitrogenous fertilizer should be applied with the airplane or with ground equipment, was kept open, which made possible a good adaptation to the actual situation. Even the disk fertilizer spreader D385 can be incorporated in this system properly for the first nitrogen application. Since this fertilizer applicator is set for a working width of 5 m, it is necessary to move once over the travel lanes and once between the two adjacent travel lanes. The exact system of movement can be supported by directional indicators. It must be considered that the outer disk has its application amount reduced by 50% since otherwise a double amount of the fertilizer would fall upon a strip 1 m wide. In the case of the second N application the application can be carried out successfully from the travel lanes with the centrifugal fertilizer spreaders D028/4 (Table 2).

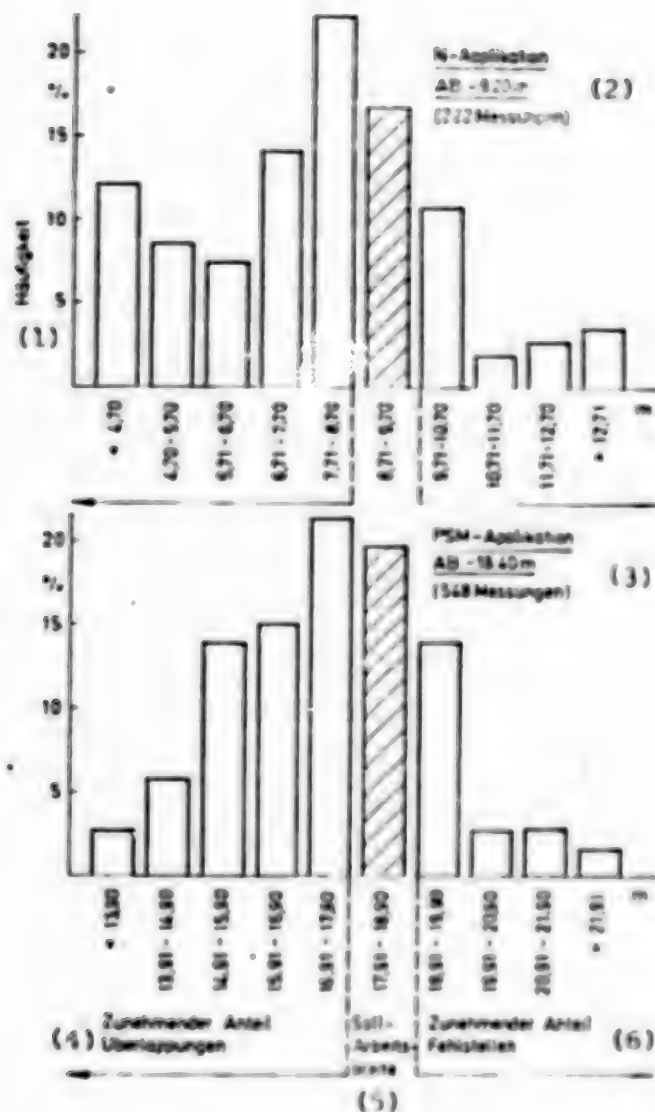


Figure 1. Frequency distribution of the track distances with the application of N fertilizer and pesticides grain fields without directional aids.

Key:

1. Frequency
2. N-Fertilizer application, separation: 9.20 m (222 measurements)
3. Pesticides application, separation: 18.40 m (548 measurements)
4. Increasing portion of overlaps
5. Theoretical working width
6. Increasing portion of missed spots



Table 2. Technological solutions for fertilizing, cultivating, and plant protecting measures on cereals on the VEG Plant Production Schwaneberg and the LPG Plant Production Thiesen

Task	VEG Plant Production Schwaneberg			LPG Plant Production Thiesen		
	Machine Equipment	Working width m	Remarks	Machine Equipment	Working width m	Remarks
Sowing	3 A202/T890	9.0	seed locker slide con- stantly closed	3 A202/T890	2 x 9.2	travel lane switching
Stare collecting				MTS80 THK-5	9.2	1 lane used 1 in between
Mechanical cultivation	Pake or roller, resp., with T900	9.0	mainly in ridge drill direction	ZT100, T890 with roller or rake	10	double tires 1 lane used 1 in between
Flats & application	T885	4.5	outer disk spray amount reduced 1 lane used 1 in between	- W50 LAZ with D035 - crop duster	9.2	1 lane used 1 in between 25% of fields
Second N application	- crop duster			- W50 LAZ with D035	18.4	calcium ammonium nitrate of good grade, tires ND 16-20
	- D028/4	9.0		- W50 LAZ with Kertitox "Global" - crop duster	18.4	in liquid form
Pesticides	- R20/18 E2000H - crop duster	18.5	from Feb. 5-6 with field tires	- W50 LAZ with Kertitox "Global" - crop duster	18.4	to Feb. 9, tires ND 16-20 only a small area

On the VEG Plant Production Schwaneberg an application of various pesticides is often carried out on the grain fields, particularly also in the later stages of development of the cereals. The travel lanes permit the successful use of pesticides spraying equipment even with plant growth of 40 cm and higher in the grain fields. That is quite decisive for aimed pesticides applications. A precise agreement of travel lanes and applications technology is, however, unconditionally necessary. Accordingly, the ridge drill A202 in the T890, which has a working width of 9.20 m, was set for 9.0 m and precisely adjusted to the working width of 18.0 m of the K20/18.

In order to be able to adapt the 6 m ridge drill into the system, on the VEG Plant Production Schwaneberg the guide lane method was selected, whereby a track is installed permanently in the machine center. Then during pesticides application it is driven alternately with the right or left wheel, respectively, in every third lane. The tracks are then used constantly as the directional aid for the following tasks.

#### Experience on the LPG Plant Production Thiessen

The LPG Plant Production Thiessen cultivates mainly sandy soils. About two thirds of the grains fields are planted with winter rye. In the autumn of 1984 travel lanes were set at a distance of 18.4 m (Table 1) on 3,650 ha winter cereals. That is about 90% of the fields planted with grain.

The work with travel lanes on the LPG Plant Production Thiessen begins in the workshop prior to sowing. Here the ridge drills before the beginning of the season are tested for suitability and adjusted precisely. Also the equipping of the ridge drills with travel lane switches was carried out. While they were in use, a running check on the machines was carried out by the operators. Special attention was paid to the lane measurements as well as the firm seating of the ploughshare. This is of great importance because of the great stone content of many fields in order to avoid later wrong direction.

For the chemical fertilization operations in cereals the truck W50 LAZ with low pressure tires ND 16-20 is used almost exclusively. For this reason the travel track gauge was set at 1,950 mm corresponding to the operational conditions. In order to reduce the damage to the soil during planting, the ZT301 tractors, which pull the ridge drills A202 in the T890, are fitted with double tires. As a result of the double tires the track gauge for the tractor fits the track gauge of the truck W50. Even the support wheels of the T890 were widened to this measure. Thereby it is assured that the pre-emergence treatment with soil herbicides against redtop can be safely carried out in the 18 m grid system.

In the case of necessary cultivation measures in the spring the operators work with a 10 m wide linkage as follows:

They drive once on the travel lane and once on the firm ground between two travel lanes. Even with the application of the first dosage of N (nitrogen fertilizer) as well as in the case of the stone gathering this system can be used successfully.

For the application of the second nitrogen dosage the ACZ [Agrochemical Center] is inclined to use well granulated calcium ammonium nitrate primarily for fertilization with ground equipment (D035) since only with such fertilizer passages can a working width of 18 m be assured with still acceptable qualities of spraying. All the other applications and urea are spread by crop duster. At present too a procedure for fertilizing with liquid nitrogen using ammonia urea solution is being tried out on a part of the winter rye fields. Accordingly, a working width of 18 m can be guaranteed by the use of the pesticides technology.

The synchronization of the track gauge of the sowing technology with the fertilizing and pesticides technology provides a safe and on track movement of the truck W50 LAZ during all the following operations. This leads to the physical relief of the driver, reduces the resistance to rolling of the truck with repeated lane use, and increases the uniformity of the fertilizer applications. Slipping and sticking of the drive wheels of the spreader are reduced. In the interest of the reduction of soil damage the trucks, however, should receive at all times only as much of a load of fertilizer or pesticides, respectively, as is absolutely necessary for the technological completion of the task.

The extension of the rim at the edge of the field meets this requirement.

During harvesting the portions of the residual beds could be reduced significantly through the utilization of the travel lanes on the one hand and on the other the rows of straw are laid in straight lines. This worked favorably on the performance of the straw baling machines and the reduction of the losses during baling.

#### PHOTO CAPTIONS

Figure 1. The ridge drill combine A202/T890 is suited well for the installation of travel lanes (travel tracks) separated by 9 or 18 m. The track gauge of the rear support wheels of the T 890 is matched thereby to the travel track gauge in a practical manner. The reequipping is carried out according to the technical documentation of the VEB Kreis Plant for Agricultural Technology Guestrów, Site 2501 Karow.

Figure 2. Through the additional construction of travel track switches on the ridge drills the installation of travel lanes is made easier when the travel lane distance comes to double or triple the working width of the ridge drill. The photo shows a section of the automatic travel lane switch from the VEB Advance Combine, Operating Section Bernburg, for the ridge drill combine A202/T890.

Figure 3. The tracks left by the rear support wheels of the T890 can already be used before the growth of the grain as a good direction aid for the rolling down the seed or the pre-emergence treatment with herbicides.

Figure 4. The working in travel lanes provides a regular application of the ridge drills and their constant control during sowing. Thereby a sure recognition of the travel lanes is provided and directional errors are avoided.

Figure 5. Travel lanes make possible a sure adherence to the working width even with the complex application of pesticides technology.

Figure 6. With a travel lane gauge of 1,800 mm tractors as well as the truck W50 LA/Z can be used for fertilizing and pesticides operations. For the use of the truck W50 LA/Z in winter cereals from Feekes Stage 6 (Zadok Stage 31) on resistant ground a reequipping of the truck with high pressure tires corresponding to the innovative proposal of Querfurt (45b-2a2-014/004) or the documentation of the VEB Equipment ACZ, Construction Technology Service Schafstaedt, is possible. In this case the loading is to be reduced by 1.5 or 2.0 tons, respectively, so that priority should be given to the divided procedure with turn about at the edge of the field.

Figure 7. Established travel lanes make also possible the application of fertilizer or pesticides during the advanced stage of growth of the plants. The use of cultivator tires, plant diverters, and undercoating on the machines is thus practical in order to reduce to a minimum plant injury.

Figure 8. Without the establishment of travel lanes this kind of picture of tracks is found after numerous crossings of the field after the harvest. Unfortunately such fields are still no rarity. They should, however, soon belong to the past.

12466/12955

CSO: 2300/543

IMPROPERLY APPLIED FERTILIZER RESULTS IN DEFICIENT CROP YIELD

East Berlin DEUTSCHE BAUERNZEITUNG in German Vol 26 No 13 29 Mar 85 p 5

[Report on interview with Dr. Klaus Kampfe and Dr. Lothar Hannusch at the Institute for Fertilizer Research, Leipzig-Potsdam, by Georg Martin; date of interview not given]

[Excerpts] Georg Martin: Working with the concept of highest yields in many places has led to the fact that apparent errors in fertilization have become rarer. Now and again, however, the technological "stripe diseases" is found. Actually, how does this affect the yield?

Dr. Klaus Kempfe: Very negative. If the errors in fertilizing have already become evident, then it can cost the cereal growers up to 10 dt grain per hectare. They even suffer still more when the plants are later piled upon the rows supplied with too much nitrogen. Indeed those errors also that remain hidden limit the yield. They appear with spray precision of 15 to 20 percent (with it the quadratic deviation from the average is characterized; the ideal value is thus zero). Winter cereals react then depending upon the nitrogen dosage with a one to five percent lower yield. Accordingly, the conclusions from this can be only to distribute the fertilizer in such a manner that each plant receives at its root region the same amount as closely as possible.

Georg Martin: What is required from a good spray pattern?

Dr. Klaus Kampfe: For this there is a Technical Center standard. According to this the quantity per hectare may not deviate by more than five percent and the spray precision not exceed the value by more than 15 percent. If the fertilizer is supposed to fall upon the field like a well-woven veil, the equipment must be tested more often and if necessary, adjusted anew.

That the spray attachment D 035 can operate very precisely is illustrated by the curve in Figure 1. This is shown by the evident flat slope at the sides. In this manner during fertilization the conditions are good for an even overlapping along the sides.

In contrast Figure 2 shows a very poor spray precision (45 percent). Most of the inorganic fertilizer was deposited in the area along the line of travel.



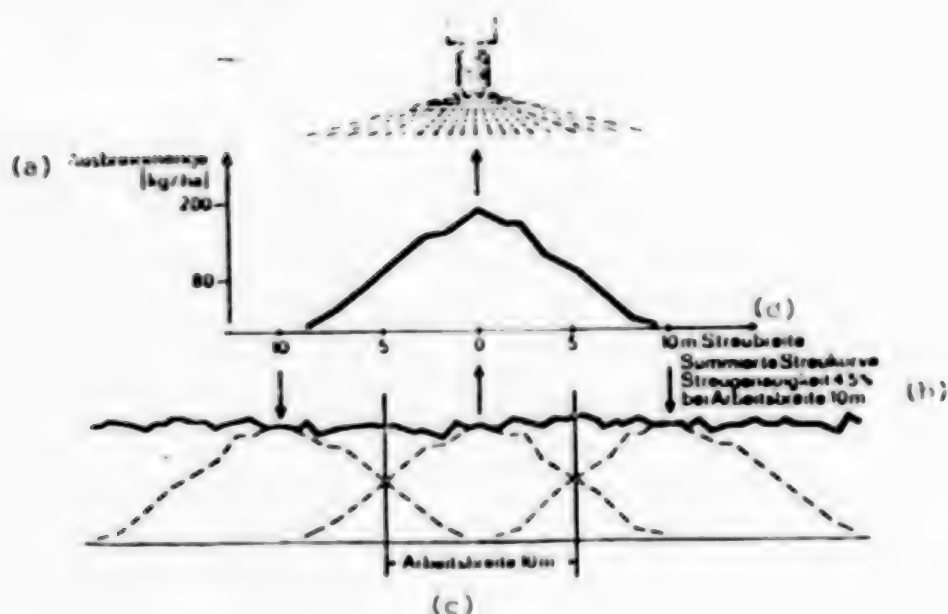


Figure 1. Distribution of inorganic fertilizer with a very well adjusted centrifugal disk sprayer

Key:

- a. Application rate
- b. Composite spray curve, spray precision within 4.5% with a spray width of 10 m
- c. Working width
- d. Spray width

An application of 130 kg/ha in such a case can be distributed during one run that in places 50, but also at times, 250 kg can be found. Winter barley, depending upon the type of soil, responds to this with a reduced yield of 2.7 to 3.1 dt/ha.

Georg Martin: Which technical and organizational conditions must be provided by the ACZ / Agrochemical Center/?

Dr. Lothar Hannusch: The technical-functional reliability of the construction groups must be acknowledged, the sprayer properly adjusted, and expertly serviced. Moreover this means the maintenance or consideration, respectively, of the physical characteristics of the fertilizer (granule size, moisture, density). In the well organized ACZ the sprayer of the collective is handed over to the workshop of the spray brigade with a quality certification. With this it guarantees, for example, a number of revolutions for the centrifugal disk of 1,000 revolutions per minute (plus or minus 100) as well as their

synchronization (plus or minus 3 mm), the symmetry of the conveyer (plus or minus 3 mm) as well as the metering valve (plus or minus 5 mm) and the parallelism of the valve rubber (plus or minus 2 mm). If these tolerances are not maintained, even with precise, connected traveling on the field, spray errors arise.

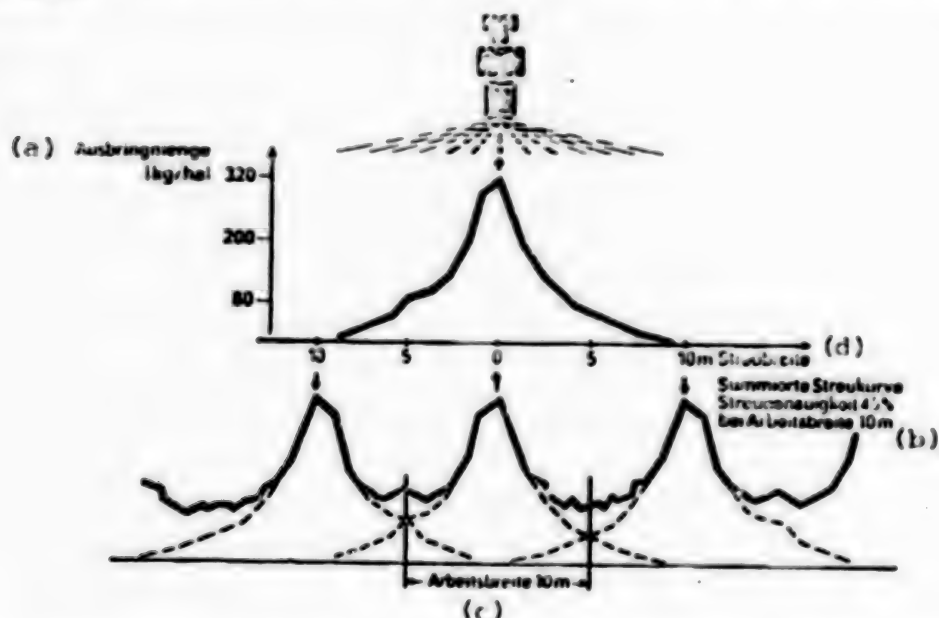


Figure 2. Distribution of inorganic fertilizer with a badly adjusted sprayer afflicted with technical defects

Key:

- a. Application rate
- b. Composite spray curve, spray precision within 45% with a spray width of 10 m
- c. Working width
- d. Spray width

Moreover the possibility for testing the spray precision must be acknowledged. For this purpose the rear axles of the vehicle are raised so that the drive wheels can turn freely (with urea at least 200 m come to 61 revolutions; in the case of calcium ammonium nitrate 100 m require 30.5 revolutions of the tire ND 16.20). The five adjustment stages needed for the application pattern are to be derived for each N fertilizer and each sprayer attachment. The rate of application table set up in this manner belongs to the machine and cannot be transferred to any other. If the conditions change, the rate of application table must be properly adjusted.

Georg Martin: How can the driver himself have an effect on the spray accuracy?

Dr. Lothar Hannusch: Our vehicles cover daily 60 to 80 hectares. The mechanic must take into account accordingly a relatively high rate of wear on the parts

already mentioned. In particular he has to adjust the delivery funnel in such a manner that a great spray precision is achieved. For this purpose the proper test equipment is necessary. Spray guides and delivery funnels must be cleaned daily. Moreover it means keeping the number of revolutions of the spray disk within the prescribed range. If it is really too high, a "coffee mill effect" is obtained. The fine granule portion increases; in contrast the working width decreased. A too small number of revolutions causes the covering in the middle of the sprayed surface to be too thin. For reason we recommend according to an innovative proposal from the ACZ Grosssteinberg ("Stationary Test Platform") near Leipzig that they be tested with the truck tachometers.

Georg Martin: What is the particular responsibility of the driver on the field?

Dr. Lothar Hannusch: The retention of the spray widths and a precise connected travel no missed spots. This is difficult whenever the agricultural center did not lay down travel lanes. Investigations show that there even such great tolerances such as those of plus or minus 1 m can be held to only 70 percent. With travel lanes the operator achieves not only a higher quality of application; he also damages fewer plants which pays off with an increased harvest of 1 to 2 GE/ha GE = grain units. Accordingly, in countries with intensive cereals production travel lanes are found on about 80 percent of the fields-- in the GDR, unfortunately, only about 20 to 50 percent.

If they are lacking, then the driver orients himself using experience by the estimation of the working width according to fixed points in the cabin (mirror edge, windshield wipers, etc.). The orientation aids should be measured exactly during the preparative period for the spray campaign for each spray vehicle so that with typical working widths secure points of reference are available.

Georg Martin: Certainly one may not travel too rapidly as well?

Dr. Lothar Hannusch: But also not too slowly. Especially small applications at a working speed below 8 km/hr at which the scraper chain transports the material only by jerks are applied irregularly. On the contrary a too high speed (above 20 km/hr) leads to the fact that above all the fine portion of the fertilizer whirls around behind the vehicle and is deposited in concentrations. The optimum is a speed of 12 to 16 km/hr.

Naturally the wind must also be observed. If it really comes from the front, it squeezes the fertilizer spray, and so the working width becomes smaller. In the case of a wind from the rear that comes in under the spray which then expands. If it blows in from the side, the spray half facing the wind gets too little. Since in any case the spray quantity also changes with the working width, the maximum wind velocities allowed are 6 m/sec for urea and ammonium sulfate along with 8 m/sec for calcium ammonium nitrate which must be observed. Based upon the possible damage, regular side winds naturally are not so critical as strong gusts.

Georg Martin: It is then possible to eliminate the technical stripe disease from the fields.

Dr. Klaus Kempfe: Yes, possible and necessary. For we could then achieve higher yields without having to use more inorganic fertilizer, diesel fuel, or man-hours for them.

12446/12955

CSO: 2300/543

## HUNGARY

### STATE SECRETARY ON AIMS OF SEVENTH 5-YEAR PLAN

Budapest NEPHADSEREG in Hungarian No 44, 2 Nov 85 p 6

[Interview with Dr Janos Hoos, State Secretary of the National Planning Bureau; date and place not specified]

[Text] Boosting the economy, improving social care is of interest to the society. Therefore all of society is interested in the question what ways and means will be or can be determined by the seventh five-year plan to achieve anticipated more vigorous economic development. In general, within five years what opportunities are we given by our productive capacity? These questions, among others, were discussed by the National Assembly in its last session, in the debate about the 5-year plan of the government. What kinds of conditions await us in the near future? Dr Janos Hoos, State Secretary of the National Planning Bureau.

[Question] You said at the last congress of economists that in the Seventh 5-Year Plan period the adaptation of Hungarian economy to the changes in world economy must be accelerated, and that this is a condition not only of the balance but also of the development and growth of Hungarian economy... If this condition is fulfilled, can we anticipate any radical changes in economic policy or more vigorous economic growth?

[Answer] Our goal in economic policy is to change over to a new, but not radically new, course of growth. Of our earlier tasks there remains the improvement of the balance of payments, its consolidation, reducing the net total of debts. However, the more vigorous economic growth we must achieve not by expanding our energy sources in number but by better utilizing the ones we have, for example, by increasing production and tool efficiency, by exporting and marketing more competitive goods corresponding to the given demands of the market. All this means that we must increase the export of products intended for the markets with non-ruble accounting, while import coming from there can be expanded to an extent greater than it was in the earlier period. And on the markets with ruble accounting we can increase our export proportionately essentially equal to that of the increase in import. We cannot speak of a spectacular acceleration or growth of economic development. That is not possible. First of all, because at present



Hungarian economy is capable of efficiency and of growth oriented toward the market only to a relatively modest extent. As against the annual not quite 2 percent average of the Sixth 5-Year Plan our national income can only grow by about 3 percent annually between 1986-1990.

[Question] Can we also realistically count on changes promoting our growth according to the information coming from the world market, from the arenas of world economy?

[Answer] From the point of view of our country's external economic relationships and foreign trade the economic cooperation with the COMECON countries is the most important. Our discussions about coordinating plans are essentially finished. As a result of reconciling the plans with each other, in our export there will be, for example, some reduction in the ratio of machine-industry products, while that of the light-industry and agricultural articles will increase. In order to increase our import of energy-intensive and raw materials we will participate in foreign investments, e.g., in the Soviet Union, in opening up natural gas and iron ore deposits. All the plan-coordinating agreements are a necessary basis for our reaching the goals of our plan. There are, however, several points of uncertainty on the non-ruble markets. In contrast to the critical situations, to the explosion-like commercial and financial changes of the past few years we can count on better balanced relationships. In capitalist world economy a moderate development cycle can be expected. Predictably demand for the technologically most modern material and energy saving products will be on the increase, although the market for reliable, middling quality, relatively less expensive goods will remain. In sum, an average 3 to 3½ percent annual growth in export can be realistic. In the structure of our exports decisive changes must occur, because we can only reach these goals by dynamically increasing the export of processing and machine industry products above all. This means novel tasks compared with the earlier 5-year plans. Concerning the growth, it is the agricultural goods, basic materials and half-finished goods that must be replaced by more competitive wares representing a higher processing level. And it is obvious that it is more difficult to break into the world market with products representing modern technology than with traditional ones. We are counting on better marketing possibilities for pharmaceuticals, pesticides, various cosmetic articles, vehicles, machine-tools, electronics products and energy producing equipment. The tasks of light industry will also greatly increase on both markets.

[Question] What tasks does the more vigorous growth of our economy mean for the branches of national economy?

[Answer] Every branch plays an important role in creating the national income, but the points of gravity will shift. Compared to earlier years industry will have a special significance. This is important, because agriculture--for the reason, among others, that the world market prices of its products show an unfavorable trend--cannot undertake the role of the pulling branch that would assure the dynamics of the growth. Neither is it an easy task here to maintain the level of export and domestic production and to raise it as planned. For this reason industry, especially our enterprises

producing the goods mentioned in connection with the export goals, must also greatly contribute to fulfilling our tasks with competitiveness and suitable market performance.

[Question] You mentioned that, besides keeping the situation balanced, reducing the total net debt is one of the most important tasks of our national economy. Thus you do not agree with some economists, especially with those who suggest speeding up growth without paying attention to our realistic and efficient export-import possibilities or, rather, to the debit of the foreign-trade balance demands. Why?

[Answer] First of all, because, for example, it is possible to debate when preparing the year-long plans about the extent of moderating our debt. But it is not debatable that the sum of our debts must be reduced. This is the fundamental requirement for our being judged favorably on the international money market, that is, for our continued ability to receive credit to continue our economic activities. What is more, our creditors must also see that we use the credits we took out not for consumption beyond our means but for investments expanding production and increasing efficiency, furnishing thereby a production basis for paying off our debts.

[Question] The economic, financial and organizational conditions are important elements of implementing the 5-year plan. On the basis of these, what kind of economic environment will surround the economic organizations?

[Answer] We determine the conditions of economic activities obviously in accordance with the already started further development of the economic mechanism, the goals of the national economy plan, the programs of centrally developing the economy and societal action. And, of course, we stimulate the implementation of these with financial preferences and central support, among others. This goes for all of those who take part in implementing the planned programs manufacturing pharmaceuticals, pesticides and intermediate oil products; socio-economic use of electronics, housing supply; helping economically backward areas to catch up. Here, too, we have the fundamental goal of promoting more vigorous economic growth to further our economic development.

[Question] The question which has been considered the most crucial one for a long time is: How are incomes developing, i.e., to what extent will enterprises revenues be centralized?

[Answer] We are trying to reduce the extent of centralization. But precisely this extent is determined by the demand of economic policy that the total debt of the country must be moderated. The financial means for doing so must be produced and saved, and in this the enterprises have an eminent role. In the next plan period, however, we are also counting on the possibility that it will not be necessary to increase the pace of reducing debts, so that the extent of centralization will not have to be increased, either. We are also trying to reduce the tax burdens of those who are serving our most fundamental economic goals, as an exception to the average-level centralization extent. That is, they should be able to have greater financial means for their developments

and personal incomes. Thus by the end of the Seventh 5-Year Plan, the intense load on the enterprise resources might moderate. It is important to stress, however, that, in harmony with the income production of the national economy and the reduction of the total debt, we can only gradually implement this idea.

[Question] The income-producing ability of the national economy obviously determines the conditions of our lives, our standard of living. Thus, what can we anticipate in the next half of this decade?

[Answer] In the Seventh 5-Year Plan period we can certainly count on having our living conditions improve as compared to the earlier period. According to our possibilities established in the course of the planning process, between 1986-1990 we can reach about 5-percent growth in real incomes. Improvements may occur in the housing supply, in public health, in schooling, in social policies. We are also planning to preserve the real value of a significant portion of the pensions, family supplements, and state support for child care. Of course, the impact of our activities of this character won't be spectacular, either. We cannot anticipate any radical improvement in our living conditions, neither can the results be spectacular in every layer of society. Our goal is to improve the situation of those layers of society which live under most difficult circumstances, such as people living on small pensions, young people establishing families. Our goals are also served by the socially more equitable, newer tax-policy regulations, by the distribution and utilization of the financial means from the national budget. It is important that these ideas or, rather, the goals of the 5-year plan coming into effect now should not merely remain the "main ideas" of the experts since, after all, their implementation serves equally the interests of our national economy and national defense--and thus every citizen of the land.

12772/9435  
CSO: 2500/92

## HUNGARY

### STATE SECRETARY DISCUSSES PRICE SYSTEM

Budapest MAGYAR HIREK in Hungarian No 21, 12 Oct 85 pp 12-13

[Interview with Dr Bela Szikszay, state secretary and president of the Bureau of Materials and Prices by Gyorgy Halasz: "An Inexpensive Country; A Journey Around Prices, Wages and Living Conditions"]

[Text] I got hold of a UN pamphlet recently. It was not a document, nor a report; it was a kind of a guide for officers of the world organization. It examined which member countries are the cheapest for diplomats. Hungary was among those on top of the list. Are we indeed inexpensive? It is not likely that the Hungarian citizen, living on a fixed salary, would say yes after his usual weekend shopping. So what are our prices like?

[Question] According to the UN we are a very inexpensive country, and indeed it must be so. If somebody comes here, say, from the United States, he can live very well on his hourly wages. But if we were to take our salaries in forints, say, to Vienna, we could hardly get by there. What is the basis for this contradiction, and what are its proportions?

[Answer] Whether Hungary is cheap or not is experienced differently by the UN officer, the tourist or the domestic population. I think this depends on two things. One factor is the exchange rate, the forint's relationship to other currencies, and the other is the price structure. Both have fairly substantially changed over the past years. On the one hand we have eliminated the dual exchange rate according to which we applied an exchange rate for tourists and another one for commerce. We had this duality in the past because the subsidization of a number of products was such that we had to evaluate the forint that the tourist received for his schilling or dollar differently from the money used in commercial transactions. This step involved the appreciation in value of foreign currencies. In the past we paid about 20 forints for a dollar; now we pay over 50.

[Question] As a result, shopping tourism on the western border has become popular.

[Answer] Indeed. I would like to add, though, that the change in the exchange rate has adversely affected Hungarian tourists as traveling abroad has become more expensive for them. It did not cut down on travel, but the result has



been that only the most well-to-do strata can afford regular trips abroad. Incidentally, from the available foreign currencies Hungarian tourists, in general, live considerably less well than at home. This is influenced by the price structure of given countries as well. While for instance an American or Western European tourist dines and avails himself of services at a very favorable rate, the same for a Hungarian tourist in the West is rather expensive. I would like to mention that, among others, these sacrifices are consciously made in order to increase our income from tourism. Let us assume that somebody in Austria has an hourly wage of 100 schillings and buys a movie ticket, say, for 50 schillings...

[Question] You can hardly get a good ticket for this money these days.

[Answer] It does not matter. For the sake of simplicity let us stay with it. If I compare the average Hungarian wage to the price of a movie ticket here, that is, if we figure with a wage of around 30-40 forints and a ticket of about 15-20 forints, the ratio is similar. In contrast, if the Hungarian tourist exchanges his forints into schillings this will mean that while the Austrian tourist coming to Hungary can buy eight movie tickets for an hour's wage, the Hungarian tourist can buy one ticket for four hours' work.

[Question] Does this also mean that Hungarian labor is so weak?

[Answer] No. Naturally, Hungarian labor is weaker, because wages have to reflect the basic differences that exist in the productivity of labor and general organization. But we cannot just compare wages, as in figuring wages we consider here that many products and services are much cheaper in Hungary. Among others, rent and local transportation are less expensive and education and health care are free. We consider pensions, too, when determining Hungarian wages and no doubt these factors are considered in Austria as well. Therefore we cannot say that the differences in wages are all due to differences in productivity and organization. These are factors, but we also consider domestic price conditions. This is why a Hungarian citizen and a foreigner have different feelings about whether something is expensive or cheap.

[Question] Let us return for a minute to the general system of prices. How is this system different from, say, that of three decades ago?

[Answer] There are few categories of the economy that have gone through such big changes as price. Thirty years ago we had a totally isolated domestic price system based on Hungarian production costs and independent of world prices. Since then we have institutionally introduced the influence of international prices on domestic manufacturers' prices. This process was no doubt helped by the price explosion that occurred in the first part of the seventies. I am thinking of energy sources. Today companies buy basic materials and energy for forints at the price level they would buy it on the capitalist world market. This is not only to make them see how expensive they are; but also because this system correctly orients one to the right choice from among different variants of development, and it helps maximize efforts to save material and energy. We do not neglect the standpoint either that competitors purchase these products at the same price. Therefore through its



costs the Hungarian company is in a similar position to its foreign competitor. Another important change is that the price system has become much more flexible. The ratio of the so-called free prices, based on supply and demand, has increased.

[Question] But if Hungarian prices have become to reflect world prices more closely -- as you just said -- how do you explain the contradiction you previously mentioned, that is, the big difference between domestic and Western consumer prices?

[Answer] In the course of changes we do not integrate our consumer price system into the international price system. We are self-sufficient in basic food stuff and the cost conditions of the Hungarian agriculture fundamentally define prices. We deviate from these cost conditions in both directions. We deviate downwards primarily in the case of services as we want to make sure that everybody gets an equal chance in securing them. Higher education should be available to everybody. Or let us say medical attention should not depend on one's salary. We strongly subsidize cultural services as well, because we want to make the enjoyment of culture available to everybody. We would like to keep the price of basic food stuff at the level of cost. In this area we do not have sales tax. But we have introduced it for a number of other items, like for toiletries for instance the sales tax is 11 percent. For clothes it is 22 percent, for tobacco, spirits, and luxury items such as fur and gold, state accumulation is even greater. The sales tax is high for automobiles and gasoline as well, although we do not consider these luxury items. So this is a differentiated policy of consumer prices, influenced by social considerations.

I would like to add, though, that we wish to determine prices according to cost, as the goal is a reasonable attitude on the consumer's part. Let me give an example. We subsidize drinking water. Somehow we have to indicate that clean drinking water is very expensive to provide. Two years ago in Budapest a thousand liters of water was available for the price of one Szimfonia cigarette. No wonder people were wasting water. Our calculations revealed that the public's water bill was 16 percent of the total cost.

[Question] What is the situation in western countries?

[Answer] In western countries the minimum charge would be at the level of cost.

[Question] So here this would mean a sixfold increase?

[Answer] Yes. We could not do this, but last year we doubled the price. Throughout the years and according to policies shaping the living standard we would like to raise the charge again, if it becomes possible. We cannot indicate to the public that water is so incredibly cheap.

[Question] In the final analysis, do prices act as agents of social policy or not?

[Answer] It is very difficult to use prices for social stratification or social policy. In the past at a simpler, or more precisely, lower level of

consumption this was perhaps easier, say 30-40 years ago when we could not even meet basic needs. At that time certain products were cheaper. Take sausage as an example; we wanted to make sure that everybody could have a satisfying meal out of this ordinary and rather poor quality product. This was a distinct step of social policy. Today we cannot achieve this kind of result through prices. It is very interesting when an idea of social policy reverses itself.

[Question] What do you mean by this?

[Answer] Let me explain it. If I strongly subsidize the price of meat I favor the poor person. This sounds good, but is not true. If we look at meat consumption, the study will show us that the poor person eats less meat and the rich one will eat a lot of it. This means that in the end I would help the rich person more. I would give him greater, covert subsidy to add to his higher salary. Instead we are working towards implementing social policy through price conditions to a lesser degree. We prefer to provide financial help in the form of family subsidy, child support -- and subsidize only the kind of products that unequivocally help us achieve important social goals. It is obvious that baby clothes are only good for one thing; the child will get them. This is to say that price is a tool of social policy. In the same vein, a small child's bed will be bought for an infant. But if I subsidize children's furniture in general, I can miss my target; this kind of furniture can be used to furnish various houses and vacation homes. Of course one cannot prevent people from washing their cars with very expensive diapers. And they do it. Well, let them, what can we do.

[Question] Along with the positive features the changes in the price system did have some negative consequences. I am referring to the substantial rise in prices.

[Answer] No doubt. When we decided to follow the path of adjusting to world prices at least in tendency and cutting down on unwisely large subsidies the result was a strong rise in the price level.

[Question] How big a rise?

[Answer] Since 1979 consumer prices have risen by about 60 percent.

[Question] This is rather substantial even just on an annual average.

[Answer] Indeed. It seriously tried the public's patience, wisdom and understanding. There were layers of society that were affected in the absolute sense of the word, as an increase in salary did not keep pace with the rise in prices. But I think we are done with the bulk and most difficult aspects of necessary changes. We gradually lessen the inflationary pressure, but are saying that we still have to leave room for justified rises in prices. They are very painful, and the public remembers previous experiences: if we fix prices, if companies do not find it profitable to produce something, then the product will disappear, there will be a shortage, selection will be narrower, we will be able to follow fashion only from a distance, and so on.

And our public has gotten used to a normal replacement of products, and even though lagging somewhat behind, we can follow world fashion, quality, and other tendencies. The product selection is acceptable, and it would be a big mistake to cut down on it. I think this would try the public's patience more than a rise in prices. So I am saying that the public is capable of tolerating a decent, acceptable rise in prices, particularly if this rise is in harmony with a rise in income.

[Question] What do you consider an acceptable level of price increase?

[Answer] I think it is around 3-4 percent. If we can couple this with a 5-6 or 7 percent rise in income almost everybody will feel that the living standard stays at level, it even rises a little.

[Question] In the past it was frequently said that the inflation in socialism is impossible. But now...Should I finish the question?

[Answer] Go ahead. It occurs to everyone, to visiting foreigners as well. When world prices change a reasonably thinking socialist country has no real alternative other than reacting with prices. Of course, it can decide on the rate. It can shock society with a price increase or it can stretch it out in time. We chose the latter. Our price increase was not a spontaneous event, we knew that it had to happen and were seeking an acceptable rate. We have to mention that capitalist countries, too, were trying to avoid creating impossible situations for the population.

Inflationary pressure is deeper, however. The price increase is just a symptom. I would say that inflation is the illness and price increase the fever. And we have to stop it, because this is a primary condition of recovery. But if we only push down the fever the cause of the illness will not be eliminated.

Inflationary pressure is the disorder of the economic mechanism, the disintegration of supply and demand, and tension in the structure. In capitalist countries this resulted in phenomena like wide scale price increases, unemployment and the bankruptcy of a great many companies. As far as joblessness is concerned, we find it totally alien in our socialist society.

[Question] While we are urging the faster liquidation of companies that do not produce effectively, and a break with rigid processes...

[Answer] The emphasis here is not on bankruptcy, but on change. We dismantled a number of rigid or unjustifiably large companies in order to make them more adaptive and independent. We are trying to use the capabilities of socialism in order to consciously develop corporate organization. If a company has to go bankrupt, if an activity has to be stopped, then we should quickly and consciously transfer production factors, the labor force, machines and material to other, more effective areas. We do not negate the process, only the form that sees the solution in bankruptcy. It is not the bankruptcy that is important but change, and we have to accept change as well. But -- and I would like to emphasize this again -- change cannot involve a phenomenon

like unemployment that is alien to the thinking of socialism, humiliates man's dignity, humanity and security, and breaks him. Poverty is not merely the lack of money, and unemployment is not merely the lack of a job, but a distorted life style that fundamentally affects one's character and relation to society. We create total employment that we would like to combine with even more efficient employment. Although we know that security established in this way gives up the production incentive of unemployment, but it is customary to say: for the sake of more goodness we have to accept a few ills.

[Question] We started with cheapness and through some complicated topics arrived at the basic issues concerning the Hungarian economy. Sir, I thank you for the conversation and the economic "journey."

[Chart on following page]

Here and at the Western Neighbor's  
THE PURCHASING POWER PARITY OF THE FORINT AND SCHILLING  
FOR SELECTED ITEMS AND SERVICES IN 1984

<u>Consumer Price in 1984</u>					
Item	Units	In Austria		In Hungary In Forints	Hungarian Price Level if Austrian Price = 100
		In Shillings	In Forints		
White Bread	kg	18.10	42.20	7.20	17
Flour	kg	12.50	29.10	8.00	27
Sugar	kg	13.40	31.20	22.50	72
Milk	liter	12.50	29.10	6.00	21
Eggs	each	2.80	6.50	2.50	38
Coffee	kg	101.90	237.00	441.00	186
Pork	kg	100.80	234.90	109.00	46
Beef	kg	130.20	303.40	115.00	38
Apples	kg	20.90	48.70	13.40	28
Bananas	kg	18.10	42.20	47.00	111
Potatoes	kg	6.80	14.00	8.20	58
Wine					
(Quality)	liter	28.30	65.90	57.70	87
Subway					
Ticket	each	14.00	32.60	1.00	3
Train					
Fare 50 km		68.00	158.00	43.00	27
Movie					
Ticket	each	52.00	121.00	15.00	12
Haircut & Shampoo					
For Men		186.00	433.40	50.00	11
Museum					
Ticket	each	30.00	69.90	5.00	7
Newspaper	each	6.00	14.00	1.40	10
Gasoline	liter	12.00	28.00	20.00	71
Hotel					
Category B					
Single w/ Bath	night	500.00	1165.00	970.00	83

12929/12366  
CSO: 2500/46



## EMPLOYMENT, WORK-FORCE PROBLEMS, SOLUTIONS WEIGHED

Budapest FIGYELO in Hungarian 17 Oct 85 p 7

[Article by Csaba Vertes: "Winners and Losers"]

[Text] Many people believe that the fluctuation of the work force has reached impermissible proportions and that it is economically irrational: instead of planned and directed mobilization the conditions on the manpower market are still dictated by the "migrating birds." Further: the number of people working in plants with a lasting deficit is not decreasing, indeed, the hunger for manpower in these uneconomical places of production is un-changed. It is (also) for this reason that the dynamically developing, profitable enterprises do not get enough employees. Further: the structural manpower shortage continues to cause graver and graver problems. The manpower problems of, for example, mining, metallurgy, the transportation industry and certain branches of light industry are not eased despite all central efforts to the contrary. And the perhaps gravest accusation: the pieces of modern production equipment, purchased at a high price, are--because of manpower shortage--not fully utilized, while many more than permissible work with obsolete machinery. And finally: leaving one's vocation or, rather, working in a job not suited to one's training (incongruence) is becoming more and more characteristic.

## Manpower Traffic of Physical Workers in Some Branches

Branch	Year	Entering	Leaving	Balance
Mining	1982	11,201	9,497	+ 1,704
	1983	11,972	10,341	+ 1,631
Metallurgy	1982	7,991	8,126	- 135
	1983	8,202	8,287	- 85
Transportation	1982	47,345	46,690	+ 655
	1983	50,508	47,867	+ 2,641
Light industry	1982	47,545	68,301	-20,756
	1983	48,115	64,963	-16,848

Let us look now, with some intention to find the causes, at the above problem,s, voiced since time immemorial and repeated in recent times more and more loudly. It is very true that in the past ten years--as the State Bureau for Wages and Labor has established--on the average every sixth person has changed his working place. Among the unskilled the fluctuation is nearing critical proportions: every year half of the total number changes places. It is also true that this motion is hardly characterized by any kind of centrally decided consciousness: behind scarcely 3 percent of all place changes can the employers' intention be discovered, yet can we say that the working-place changes carried out upon private initiative are all of them irrational economically? That is, can we accuse with the earlier passion the "migrating birds" unable to appreciate their working place, and can we suspiciously point to that economic environment which, so they say, favors only these migrating birds? Wording the question differently: why don't we realize that also the manpower movement initiated by the employees is motivated by some kind of economic rationale?

Dr Gyula Pulay, associate of the State Bureau for Wages and Labor: "If the more profitably working enterprises, capable of more dynamical development, can hire people on conditions more favorable than the average, then manpower will flow to these organizations also on its own initiative. Accordingly, the fundamental effort of regulating the economy has been and remains that the organizations working more profitably should be able to give higher earnings and better social care to their workers. It is a different question--and the shortcomings of the flow of manpower originate in part from this fact--that profitability often does not exactly express the usefulness of a given activity for the national economy."

It is time to examine more closely which are the more important directions of the employees' moving, that is, from where to where does manpower flow. Since we are past this point (see: "Where does it disappear?", FIGYELO No. 33, 1985), let us only speak about the main points now. Contrary to all beliefs about it, indeed to the convinced statements of the leaders of large-scale industry, it can easily be proven that it is not the small enterprises that tap the work force of the large-scale state enterprises. One good reason for this is the fact that these small entrepreneurs are very cautious entrepreneurs. Most of them do not desire an independent existence but have a small enterprise only while keeping their primary working place. The experts of the Central Bureau of Statistics have also proved that the migration between the branches of the national economy is not characteristically unidirectional, either, because the employment structure of the individual branches is being built less and less on a single or just a few occupational groups. (While for example in agriculture the number of those having an expressly agricultural occupation is on the decrease, there is an increase in the ratio of experts in industry, transportation, etc.)

Let us continue looking at the charges quoted in the introduction: in spite of all intentions and decisions to the contrary, the work force of the enterprises having a deficit because of their lastingly uneconomical activity does not decrease. In fact...

Why should it decrease? There is no decision, principle, or regulation according to which those working in plants with a lasting deficit would have

to be fired. There is, on the other hand, a definitely circumscribed--but so far in practice scarcely realizable--project concerning deficit-laden production, how it could be made economical or else be stopped. In this matter we could not enumerate even half a dozen examples, but who could demand accounts and why, why for example, say the Ganz-MAVAG factory is not being depopulated from one month to the next?

Dr Gyula Pulay: "What is characteristic is not at all that deficit-laden production must be maintained because of employment considerations. Much more characteristic is, unfortunately, that often things must be done to strengthen the ability of the losing enterprises to keep their work force, because the deficit-laden products of these enterprises are needed for increasing domestic supply or even export, they cannot be substituted for by something else."

Let us have a look now at the intrinsic causes of the manpower shortage having a structural character. It should be realized at last that (also) in our country a forced adaptation process is going on among the employees. To be sure, one could invoke their pride and chide them for not liking to accept doing heavy physical work in bad conditions and in an unpleasant shift, but such lead-article slogans won't get us anywhere. One should also realize by now that the structure of the working place is lagging far and ever farther behind the elementary demands of the employees. To change this structure by mechanization, technological development, organization or improvement in the working conditions is not expressly the task of labor administrators. What the latter in the government can do--at most--is easing at any price the most burning problems by a possible raise in earnings or, rather, by improving the level of social benefits. And a good example for this is--despite all the accusations leveled against it--mining which was unequivocally the winner in the much-condemned fluctuational wave. (See the table at the beginning). That mining, metallurgy, transportation and certain branches of light industry are even so beset by manpower problems? Yes, they are. But this is not because of the immeasurable fluctuation but because the problem of replacing young manpower is not solved. (In mining, for example, in 1983 the number of those taking a job for the first time was 1627, and the decrease in the work force owing to retirements or deaths was 3660). In light industry the situation is different. Only for a while is it a well-liked working place for women, many of whom--especially after founding a family--look around for a different, less exacting working place with better hours.

Let us go on: leaving one's vocation, working in a job not suitable to one's training. This problem is characteristic above all among those with a high-school or university education, and the educational authorities should slowly begin to draw the obvious conclusions. The generally characteristic overly specialized vocational knowledge or, conversely, the complete lack of vocational training can become a hindrance, and a more and more threatening one, to the desirable work-force mobility--of course, only if also the transformation of the economic organization were to accelerate. One more thing about this: one of the indisputable results of the otherwise much disputed training of skilled workers is that in the past 20 years the ratio of those employed in work suitable to their training has perceptibly improved among the skilled workers.

And the most serious charge concerning employment conditions: it is because of the general manpower shortage--for which many people unequivocally blame the fluctuation--that the most modern machinery and production equipment, which have high productivity, are idle or partially not utilized. May we ask: compared to what can this machinery and production equipment be called--just so, in general--"most modern" and "having high productivity?" Further: compared to what conditions, when, can the products made on this machinery and equipment be qualified as modern and competitive? Further: why are we forgetting those warnings--which one hears so frequently elsewhere, on other occasions and in other contexts--, according to which part--how great a part?--of our machinery and equipment believed to be "modern" are components of obsolete manufacturing technologies, and thus their operation is not necessarily economical?

Once we are on this topic it is worth, by the way, to pursue it farther. If it is true that hardly any people work on relatively modern equipment and all the more on the old, obsolete ones, then who will explain and how that at the moment of deciding and approving a technical reconstruction or a larger investment the necessary retraining or training does not start, indeed not even a mapping of the manpower needs that can be expected does? Namely, the investors continue being uninterested in the opinions of the labor experts. It cannot be proved, only surmised: manpower is so cheap, even nowadays, that it is more practical to have people work with old, obsolete machines than to replace people by indeed highly productive and, of course, prohibitively costly machines. And, since many enterprises are forced--because of the limitations of their possibilities of technological development--to think this way, and since the earning possibility when working with highly productive machines is not much higher than the average, either, the employees are not particularly attracted by the modern machines.

Then--realizing all this--what should be done? As to the work-force mobility, should we continue to abandon ourselves to private initiative and to the spontaneous fluctuation which can also be derived from an undeniable economic rationale, but is, as far as the goals of developing the economy are concerned, difficult to handle, after all? Or, if we don't, what system of instruments is needed to influence work-force mobility in a planned manner? The predecessor of the State Bureau for Wages and Labor, the now defunct Ministry of Labor, has already put down its still valid ideas in this matter. (See about this: FIGYELO Nos 23 and 24, 1979). The experts of the State Bureau for Wages and Labor repeat now:

--Only an educational system more open and flexible than today's is able to adapt itself to the fast-changing need the economy has for experts by giving the students an education utilizable in a wider range than the present one is. To remark: there are certain indications justifying the hope that the educational system will be developed in such a direction, in fact we could already report in this connection an autonomous initiative, essentially independent from official educational policy. (FIGYELO No 38, 1985).

--It is an encouraging start that the earlier system of manpower channeling which had an official character and was practically useless has been transformed into a kind of special service and that the personal and technical conditions of this service were created relatively fast.



--According to the theory valid in principle but questionable in practice the organizations working more profitably should be able to pay their employees more than the average. And, of course, they should also be able to spend more on social care and on improving the working conditions. In case of a consistent realization of the theory--dependent largely upon the regulating system --the wandering of manpower might immediately become more directed. (And what will happen in this case with the enterprises working without profit? The point of view of the State Bureau for Wages and Labor is: extraordinary and central directives concerning the individual occupational groups will play a role important for the time being but much smaller than it is at present).

--In the wake of making the conditions of management stricter it is characteristic even nowadays that the enterprises are more and more holding back their efforts toward reserving manpower. To be sure, we cannot witness as yet larger-scale decreases in numbers or more significant inter-enterprise regroupings, but the practice of "let us retire him and not hire anybody in his place" is becoming more and more general. If management conditions continue to become stricter--and if the system and the methods of directing the economy will be developed further--, we can expect the further unfolding of this process. Consequently, in the future the repeated putting to work of workers who have lost their original place of work might play a more and more important role in influencing the work-force mobility. Not only by having to create--if necessary, with state support--new working places in certain areas, but--mainly--by extending the practice of retraining and developing its methods.

12929/12772

CSO: 2500/39



EXTERNAL ECONOMIC SITUATION, INFLATION DISCUSSED

Budapest MAGYAR NEMZET in Hungarian 5 Nov 85 p 5

[Article by Istvan Hagelmayer, Director of the Research Institute for Financial Matters, PhD candidate: "Renewed Economy"]

[Text] Searching for the causes of the present inflation it does not seem impossible that it is the result of the economic policy of previous years -- and its justly made corrections -- that cause the undesirable side effects of inflation. And if this proves to be true, or partially true, it occurs to one whether suppressing inflation by any means will not go along with the slowdown of the correction process or with its halt.

Accumulating Debt

As a result of the 1978 price explosion on the world market the exchange ratios of our foreign trade deteriorated sharply. Therefore in order to maintain our foreign trade balance we should have increased the volume of our export to the extent to which the price level of imported goods exceeded that of export products. This solution would have naturally decreased domestic product selection, and this would have pushed the price level up without changing the position of the owners of money. This is to say that following this road inflationary pressure would have appeared already in the seventies. But as everybody knows this is not what happened. (We know in that case we could not have achieved a perfectly balanced foreign trade). In the above time period economic management thought it necessary to maintain the usual growth rate and to increase the living standard and investments. During those years this was made possible by ample international credit of which we availed ourselves more and more.

And so it is understandable that our import regularly exceeded the increase in our export with the only exception occurring in 1975. We have to add that while the price of imported goods increased at a faster rate than we could raise the price for our products, the volume of import -- except for one year -- rose at a faster rate than we could widen our export. This is how the situation could develop in which the import surplus for 1978 reached 9.2 percent of the value of the annual GNP.

It is not our task to evaluate the economic policy of this time period; this was already done by the responsible organs. But it is perhaps worthwhile to summarize in retrospect the conclusions regarding inflation. The first thing we have to say is this: In the above time period our production was not forced to adjust to the changed situation on the world market, to improve its market position. Therefore there were no guarantees that increasing investments were going to improve production, and through production the entire economy. It also became clear that along with an unchanged structure an increase in production will only add to their debt. Together with the increase in investments, the import that regularly exceeded our export provided a chance to improve our living standard, as domestic consumption exceeded domestic production.

The import surplus increased domestic product supply, and for this reason -- assuming all other factors stayed the same -- the price level should have been pushed down. (This is not what happened, but we do not have an opportunity here to describe the domestic causes). But we can perhaps still form this general hypothesis: if reacting to deteriorating exchange ratios an economy is not capable or not forced to increase its export to counterbalance a faster price increase for imports -- decreasing in the process its domestic product supply -- it can temporarily free itself of the depressing burden of inflation, but it does not solve the problem. It only postpones it. That is, a solution will have to be found in the future...

#### Slowing Down and Accelerating

But this future is our present! In retrospect we can see that the turning point was in 1979. At that time the volume of export, compared to the previous year, increased substantially, by 15.6 percent. Meanwhile the volume of import decreased considerably, by 9.6 percent, although this is compared to the exceptionally high level of 1978. Compared to the previous year the import surplus dropped to less than half. After two "quieter years," 1980 and 1981, the next two years brought an export increase of over 10 percent, while import decreased in 1982, and increased somewhat in 1983. Spanning the time period from 1973, 1982 was the first year when domestic consumption stayed below domestic production. It took us more than a decade to reach a year when we had an export surplus in the amount of 0.8 percent of the GNP. Naturally, this export surplus decreased domestic product supply, and this -- other things being equal -- became a factor increasing the price level.

But can we say that inflationary pressure created by the decrease in domestic supply appeared first in 1982 -- at the time when our foreign trade balance showed a surplus? The answer is no. This factor has been present in our economy since 1979. The changes in the domestic distribution in a given year are not defined by the positive or negative balance of foreign trade, but by changes compared to the previous year. And import surplus has decreased annually since 1979, figuring 3.3 percent of the GNP in 1979, but only 1.1 percent in 1981. From the next year on the foreign trade balance has shown an increasing export surplus.

Domestic product supply has been restricted not only by the export increase, but by cutting down on import as well. As a result, in the years discussed

the inflationary pressure "passed onto the future" had an accumulated effect, and this can only be lessened if the economy has, or can activate, very strong counterbalancing mechanisms.

Nobody would argue the positive changes in Hungary's foreign bill situation. But it would be a mistake to deny that the forced quick improvement had several unfavorable results, and the domestic foundations of this improvement are still very shaky. Restricting import, for instance, caused disturbances in production relations. And the forced increase of export was accompanied by a deterioration in exchange ratios and a fast growing inflationary pressure. And our external situation can be considered unstable because it has not yet been established by improving the effectiveness of the product structure. This change could moderate domestic inflation in export as well.

There is no doubt that the change of economic policy in 1979 was necessary. But because it was late, it could not set spectacular goals for itself. Because of the accumulated tension it could only attempt to straighten out the errors committed in previous years. This is how restoring the external balance and keeping the living standard at level became prominent tasks. But given our product structure at a time when our export capabilities were far beyond the import needs of production, this was possible only by slowing down the previous rate of growth.

This solution, this "putting on the breaks," can be considered as a method forced on us temporarily by our well-chosen goals. But it is also clear that slow growth will lead to economic development and boom only if an accelerated change in the opinion of the world market occurs regarding production and product structure. But this process lagged well behind demands. In other words, "slowing down" was successful, but "accelerating" was not.

Particularly as a function of forced slow growth, the improvement of the external balance required a drop in domestic consumption. As a result of companies' unwillingness to save, intervention through the budget was inevitable and this meant stronger centralization of companies' income. Other solutions did not even come up, and in previous years nobody questioned the expediency of centralization. The budgetary "pressure" was further strengthened by the specter of our inability to pay our foreign debts. This is what led to the gradual freezing of compulsory company reserves and their acquisition later, to the levying of various dues and taxes that hindered the accumulation of reserves, and in general, to making production factors through taxation more expensive. No matter how painful this process was for companies and how much disturbance this caused them, it would be a mistake to deny: under the given conditions this budgetary policy was the most suited to achieve our economic goals.

#### A Function of Power Relations

A common and reoccurring criticism is that raising the taxes -- through passing them on -- contributed to a rise in manufacturers' prices. According to this view the taxation policy of this period fundamentally induced inflation. Manufacturers' prices indeed rose, but let us add: between 1978 and 1979 they, rose more slowly than consumer prices. It is true that in 1980-1981 the rate

of the increase for manufacturers' prices exceeded that of consumer prices, but during the next two years the process reversed itself again. But when evaluating taxes and their role in this time period we should keep in mind that the factors of the price increase and its role in passing on the taxes have not been examined.

Incidentally, it is easy to see how the desire to pass on taxes is a natural reflex of every enterprising unit. But success is a function of economic power relations. Passing on taxes cannot be successful if the price before taxes was a balanced price; if the buyer can choose from among suppliers; if the buyer has no chance of passing the tax on because, among others, keeping his profitability, solvency, and his general economic position are in his fundamental interest. The existence of these conditions is not typical in our economy, that is, passing on a portion of taxes is indeed not out of the question. Therefore the objective of levying taxes -- forcing to make a greater effort -- suffers. But this in itself does not question the validity of the objective, particularly since we do not have others methods at our disposal. The above outlined situation points to the creation of conditions. The realization of our economic policy demands the loosening of monopoly and everything that is related to making companies more sensitive to budgeting, including the realistic danger of bankruptcy.

12923/12366

C30: 2500/51

FOREIGN TRADE RESULTS IN FIRST THREE QUARTERS NOTED

Budapest FIGYELŐ in Hungarian 31 Oct 85 p 9

[Article by Gyorgy Pataki]

[Text] In the first three quarters of the year the quantity of our exports exceeded last year's levels approximately as planned. At the same time our imports increased at a substantially faster rate than had been foreseen in the people's economy plan.

The increase in non-ruble account exports accelerated somewhat in the past few months, though their quantity exceeded last year's first three quarter volume by barely two percent. The modest increase came mainly from three areas: oil refining industrial products, wheat and public transport vehicles.

Diminishing Exports

Compared to its level of a year ago, the dollar grew stronger against the rest of the currencies. For this reason and because of a close to 180 million dollar price loss suffered in exports, the intrinsic worth of exports (expressed in dollars) in the first nine months remained substantially below that of the same period a year ago. Industry more or less repeated its last year's performance, while food industry exports dropped by more than 100 million dollars.

Behind the unchanged levels of industrial exports there seem to be some positive and some negative factors.

Metallurgical exports decreased by about 60 million dollars: one third due to a reduction in rolled steel exports and more than one half as a result of fewer exports of aluminum products.

Light industry exports have also dropped (by about 27 million dollars). For one third of this a lack of raw materials for the garment industry was to blame. Furniture exports have shrunk because of prices too high for the quality offered and/or simply poor quality. In soft leather goods both demand and prices have dropped, while in shoes--according to orders on hand--a relatively greater proportion was left over for the last quarter.



These deficiencies were counterbalanced by greater performances in the chemical and machine building industries. For increased exports in the chemical industry, fossil oil derivatives (among others, aromatics and olefin products) were responsible. Four fifths of the increases in the machine building industry came from public transport vehicles: exports increased by 20 million dollars, due to the fact that, by the end of September, the enterprises were able to meet a greater proportion than usual of their yearly commitments.

In the exports of foodstuffs, the food industry continued lagging by about 140 million dollars behind those of the previous year, mostly because of a drop in prices and/or a reduction in exportable quantities (the latter holds true mainly for pigs); the pluses in agricultural exports became possible because of a 600-thousand-ton increase in wheat sales. (To be sure, the price of wheat, too, dropped by about 6 percent).

### Energy Sources

Convertible account imports increased considerably, mainly because importation of energy sources grew to more than three times the quantities originally planned, and machinery imports exceeded last year's by 100 million dollars.

While, of the energy sources just a year ago, only coke needed to be imported in larger quantities, this year significant amounts of natural gas, heating oil, fossil oil and coal had to be purchased in non-ruble account markets. This account, so far, shows a balance of about 250 million dollars.

A further one quarter of the increase was the result of extra demand for spare parts. Additional imports in agricultural products were essentially of the same value as the greater-than-planned seed corn requirements.

In light industry products, too, 3 to 4 percent more imports were needed. This covered the raw material requirements of the fast growing ruble account export (for example, an additional six million dollars' worth of cotton was needed than last year). In addition, domestic commerce, too, ordered considerably more in shoes, knitwear, stationery (imports in these categories increased by 13 million dollars).

At the same time, the total value of imports decreased due to the fact that the prices of some of the important import items became more advantageous this year than they were last year (steel plate, plasticizing alcohol, synthetic silk yarn, fertilizers, protein fodder, etc.) and because production has grown at a slower rate than planned.

### Making Up For Shortcomings

Ruble accounts exports grew by over 11 percent in the first three quarters of the year. Within this sphere, exports to the USSR exceeded last year's by 14 percent. Three fifths of the increment came from the machine building industry in the form of spare parts, public transport vehicles, instruments and computer technology. One fifth came from light industry: shoes, textiles

and garment products. This sizable increase, in part, was necessary to offset last year's backlogs.

Aside from the above, exports of pharmaceuticals and plant prophylactics underwent a dynamic growth. Exports exceeding last year's figures were registered also by enterprises engaged in the manufacture of canned vegetables and liquor. Imports from ruble accounting countries increased by barely two percent. This includes 45 million rubles' worth more in machinery and 27 million rubles' worth more in electric power coming into the country.

If we compare this year's objectives with the first nine months' accomplishments, we cannot, again, but note that in our foreign trade there does not remain any less to do in the course of the last quarter than in the same period last year.

12929/12759

C30: 2500/55

# ADJUSTMENT OF LEGAL MEASURES TO DEVELOPMENT OF SOCIETY DISCUSSED

Budapest MAGYAR NEMZET in Hungarian 17 Sep 85 p 5

[Article by Dr Imre Markoja, minister of justice: "We Are Adjusting the Legal Measures to Society's Development--Renewing Economy"]

[Text] This article was prepared on the basis of an introductory speech delivered at the national conference held last Thursday at the Hungarian Chamber of Commerce headquarters.

In the area of developing our economic construction and perhaps even our legal system development the most significant task was modification of the law concerning the state-owned enterprises. Our basic principle during the modification continued to remain valid that the wealth managed by the state enterprises is owned by the state. But we reorganized--with the exception of the public utility enterprises--the way the ownership rights are exercised: we transferred the overwhelming majority of these rights to the enterprises and kept only a few basic rights for the authorities that direct the economy.

## Greater Independence--Decisions by Bodies

Expanding the enterprise ownership authorizations was not a self-serving act. That is, the national economy's ability to produce income can be increased only by increasing the efficiency of production in the economic operating units. And this requires strengthening of the cost sensitivity of the enterprises, improvement of the enterprising behavior and of the financial interest. All this is unimaginable without expanding enterprise independence which in the laws is reflected in expanding the sphere of the ownership rights.

Earlier our enterprise laws specified that the management of all enterprises is performed by the manager with single-person responsibility. We have in part broken through this concept as early as during the 1981 modification of the law when we declared that at enterprises which have separate organizational units the branch that has established them can set up management councils which have decisionmaking authority in the so-called strategic questions. This time we generalized decisionmaking by bodies in the main questions of economic operation of the enterprises. We determined the composition of the managing bodies of the enterprises in such a way that worker representation was given exclusive or definitive role in them, while this at the same time means that plantwide democracy has been elevated to a higher level.

Keeping close contact with the tasks of further developing the economic management system we prepared the law dealing with prohibition of unfair business practices and the order by the council of ministers regulating economic fines. It is a generally known fact that in the present planned mechanism of the economic control system based on market regulation fundamental economic policy and legal policy interests are tied to being able to take an effective stand in the area of economic relations against all forms of unfair business practices. The new regulation protects the interests of the consumers as well as of the competitors and provides protection against all forms of unfair business practices.

The legal decree dealing with directing the economic operating organizations to perform specified economic activities and reimbursement for the damages caused by this is a highly significant legal regulation in further developing the economic control system. I would like to call attention to it here that the economic management can order the enterprise only in an extremely narrow area to perform specific activities.

We have recently created the basic legal regulations which serve to further develop the economic control system. The main task now is to consistently implement these legal regulations and within the limits of the modernized control system ensure with efficient work that our economic policy goals are implemented.

But to fully build up the changed economic control system also makes it necessary to create additional legal regulations and to modify them on the basis of practical experience. Thus for example, further development of the economic control system makes it justifiable to place on the agenda modernization of the legal regulations dealing with associations.

From the economic viewpoint it is necessary to deal with the question because the regulations now in effect are no longer in every respect suitable for the foreign market requirements the capitalist partners demand from us. Furthermore there is in this country also a need to modernize the legal regulation of several organizational formats--such as, for example, the corporations to use this more extensively so as to enable the economic organizational system to flexibly adjust to the multifaceted and rapidly changing demands of the economy and the market, and to promote even better the efficient and profitable flow of capital.

In recent years--as a very consequence of further developing the economic control system--the significance of lists of firms kept by the courts has increased. As is well known the basic function of this is to have a reliable, authentic record from the business viewpoint of the organizations which conduct economic activities and thereby to promote legal implementation of protecting the interests of creditors. The statute ordering that a list of firms be kept, which has been in effect for nearly four decades should be modified thus coordinating it with today's economic circumstances.

I would like to place special emphasis on the newtype of regulation which--instead of the national administrative authorities--provides the business courts with investigative authority in case the economic associations, civil



law associations, economic work cooperatives and the national interest representation bodies of cooperatives, enterprises created by the social organizations and associations and the subsidiaries of these registered in the list of firms operate in violation of the law. That is, in these cases the business courts handle the legal control. We believe that this solution that is known and approved all over the world will serve well to implement the law and that the courts naturally extend only over the establishment and remedy of the violations, it does not represent authority of operative control.

#### Firms Operating at a Loss--and Their Creditors

Past experience gathered from our procedural system concerned with state enterprises operating at consistently low efficiency and with organizations that are unable to make payments, those operating at a loss and lacking funds, justify work on developing a new type of regulation concerning the elimination of inability to make payments. Here we consider it our job to ensure the balanced economic operation of the enterprise and to possibly prevent the development of consistent inability to pay.

In case the inability to pay--insolvency--develops in such a way that elimination of the economic operating organization is unavoidable, legal regulation must be developed which protects the interests of the creditors, ensures impartiality of the decision as well as the implementation of other important social interests.

The agreements applied in practice so far which the representatives of the state and some enterprises have been negotiating--trying to reach specific economic goals--are in accordance with the principles of further developing the economic control system. This makes it necessary for us to develop the economic and legal systems concerning these so-called national administrative agreements. Innumerable questions waiting to be clarified arise in this area. The goals of these agreements must be defined. It must be made clear what the connection is between the benefits that can be given to the enterprise and the regulatory system as a whole; which organs are authorized to negotiate such agreements on behalf of the state, at the expense of which financial resources. From the legal angle it must be examined whether a classic contract is the subject where the parties are of the same rank or whether subordinate-superiority relationships also permeate the agreement. That is, in this latter case we must develop an independent legal institution. One further question is whether in the case of a disagreement remedy can be requested from the courts, and what means can be applied if the terms contained in the agreement are not fulfilled.

#### Small Enterprises: In the Socialist Way'

Recently the situation of small enterprises has acquired an increasingly important role in the agenda of the press, radio and television. Many kinds of voices can be heard in this area. There are those who praise them to the high heavens. There are also those who consider organizational formats of small enterprises to be the causes of all problems. I am convinced that the small enterprises and the economic and social effects generated by them can be evaluated realistically on the basis of the experiences of the last 3 years. I



think we can all agree with the statement that there will also in the future be a need for supplementary and auxiliary activities which will fit into our socialist economic system, improving degree of efficiency of the economic operation and helping supply higher standards for the population.

The legal regulation concerning small enterprises has now for 3 years been standing up under the test of practical application. We sincerely admit that in some areas the regulation has not been completely successful and we cannot close the door to further development. We must further develop the rules of operation for organizations conducting supplementary and auxiliary economic activities in such a way that they will strengthen the economic interest, at the same time preventing income amassing without work or out of proportion with the risks taken and the work performed. The planned modification is not expected to result in fundamental changes, yet it will provide solutions for a few questions handled up to now only through legal interpretation. Thus for example, the modification will make it possible to expel someone from economic work cooperatives. In some cases the statute will require mandatory terminations. In accordance with the changes in the business law regulations the order of legal supervision will be modified. According to our thinking--and the majority of those affected agree with this--in order to simplify the regulation, it is necessary to eliminate the requirement that the authorities approve and register as firms the enterprise economic work cooperatives, primarily at those enterprises which do work exclusively for their "own" enterprises. With this solution the enterprise economic work cooperative--in accordance with the present situation and practice--will be an internal organizational unit of the enterprise, yet we do not exclude the possibility of taking on external work, either, because the work cooperative will at the same time also remain a company which can obtain rights and accept obligations under its own name.

8584/12859

CSO: 2500/75

OFFICIAL CLARIFIES ROLE OF AGRICULTURAL CO-OP ACTIVITIES

Budapest OTLET in Hungarian 3 Oct 85 pp 14-15

[Interview with First Secretary of TOT (National Council of Agricultural Producing Cooperatives) Dr Janos Eleki: "Interest Protection Goes Along With a Lot of Battles and Struggles ... Discussion About the Large Agricultural Enterprises and the Household Farms"]

[Text] The activities of TOT are geared primarily to interest protection. During the latest broadcasting of the program HATVANHAT (Sixty-Six), First Secretary Dr Janos Eleki, replying to the audience's questions, gave among other things the following very realistic definition of the TOT's activities, that also forms part of our headline: "We have to represent the interests of the agricultural producing cooperatives and that of their members. Some times we have success, but there are cases in which the counter-arguments are such that we give us beaten. Interest protection is not a simple process, it involves many battles and struggles ...." The program in question focused on two basic topics, namely on that of the agricultural producing cooperatives and the household farms. Afterwards, in compliance with the traditions of OTLET, we have asked a few other questions from the guest of the program HATVANHAT.

[Question] What is the difference between your activities and those of the Chamber of Cooperatives, which represents the enterprises, and those of the Trade Union which represents the workers?

[Answer] Our interest protecting system is peculiar. In its structure democratic centralism prevails. There is no subordination or dominance whatsoever in the relations between the county interest protecting organizations and the TOT. We differ from the Chamber insofar as we take not only the cooperatives' interest into account but also those of their members. These two kinds of interest protecting activities are not and they cannot be separated. The same peculiarity distinguishes us also from the Trade Union. Let me add to this that roughly one million persons are involved in this and around 1,300 cooperatives.

[Question] You emphasized in the program that you are in favor of the farms' basic activity and it should be an important task of interest protection to support it. But there is an old controversy about what is considered as basic activity...

[Answer] Yes, because in many cases the divisions are wrong. An example for this is food processing. For a long time we have been arguing against the current nomenclature, and relentlessly pointed out that the classification which defines food processing, which is closely connected with basic agricultural activities, not as a basic agricultural activity but as an ancillary one, was wrong. If this classification would be rationally made, the proportion between basic and ancillary agricultural activity would at once become logical; of course to the advantage of the basic activity.

[Question] However ancillary and subsidiary undertakings in the farms are of undeniable importance. As professional cooperative members like to say, without them many of the cooperatives would not be and could not be viable. I would even venture to say that in general and taking them as a whole, their profits are greater in this area than in their basic activity.

[Answer] Nobody would deny the possibilities, as many would say, of "money making" which are provided by ancillary and subsidiary activities. But as a matter of fact we should keep in mind that the bulk of the cooperatives' profits, quite exactly 65 percent, stems from their basic activity. But it would be idle to separate the two in an artificial way. In historic perspective the activities of Hungarian peasants, above all during winter, always included tool manufacturing, wood lumbering, charcoal or lime-burning and for those who had draught animals, transportation. These activities did not even then belong to the farmers' basic activity in terms of our present vocabulary, but they could not yet apply to them the fitting epithet. Above all, where the quality of the cropland was inferior, peasants were compelled to complement their summer income possibilities. Even now ancillary activities are more vigorous in places where the crop of the land alone does not assure the safe survival of the settlement. Ancillary activities are providing employment, income possibility and industrial culture. Their gamut of trades is quite wide-ranging, since we find in it from syrup-making to the manufacturing of printed electric circuits almost everything. Our interest-protecting organizations also consider it appropriate that the cooperatives had survived and that they are prospering, noting thereby that they should not abuse of their possibilities. And we ought to see here another thing, namely that not only the rural population takes advantage of this situation, but also the cooperatives themselves, since a good portion of the income thus obtained can be invested into development and the modernization of the basic activity.

[Question] The question of what is useful and to what extent can be best assessed on the behavior of the household farms. They react within weeks to changes in this respect. But if we analyze the figures of animal husbandry, we unfortunately find the same in the reaction of the large agricultural enterprises. Insofar as the current changes in the procurement prices are concerned, it would be difficult to make predictions. How can you explain the "change" in the requirements?

[Answer] It is well known that meat production in our country is outstanding even for world standards. We are on the top of the world scale, whether we look at our hog, poultry or cattle production. While we are proud of this and are glad about it, we also must see its drawbacks. We cannot consume the per capita 80 kilogram meat produced by us, since we have to export an important

portion of it. And this will be so also in the future. Our main preoccupations are related to our sales abroad and these have a certain impact on the large farms as well as on the small ones. They have their backlash. We once have often said that we ought to move closer to the world market. This has now happened. But we must also accept its consequences. For the world market is not interested in what kind of hog we chose for breeding, but it has its definite expectations and demands for its money. We have to face this and our interest protection ought to consist of a careful preparation for smooth transition in that direction.

This is all the more important since we now have to prod again the farms, be they big enterprises or household plots. For the replacement of slaughtered pigs, not to mention the butchered cattle, takes a lot of time, as a consequence of the biological law. Now, that the new requirements have been announced, to what extent have the conditions been established for the necessary change?

The new procurement system of hog prices will only be introduced in 1987, in order to--as you said--make time for the change. The original plan has set the switch for January 1986, but the time for preparation proved to be too short. The following year will be interesting because, while the procurement prices will remain unchanged, the producers will always be informed about the price at which their pigs would have been purchased according to the new system of qualifications. The enterprises and individual farms will have one year for the evaluation of the new prices and for bracing themselves for it. It is the duty of the big enterprises to help make the change smooth by breeding stock and creating the proper conditions.

[Question] We often use the expressions household and auxiliary farm. What is the difference between the two?

[Answer] Household farm means that its owner's principal occupation is to work in an agricultural producing cooperative. Those small farms which do not belong to this sector are called auxiliary farms. But it is important to point out that it is the agricultural producing cooperative's duty to support both household and auxiliary farms equally. Contracts made with either of them are of equal value. In many areas of the country the cooperatives accept the identical servicing of both forms of small farms for almost the same fee. By the way, nowadays the household farms are no longer the majority, there are more auxiliary farms. Their owners are mainly workers who are living in the villages, white collar workers and old-age pensioners. And if we add the weekend-house owners to this category, although these till their garden or land only for their personal needs, we may say that working on a small farm has grown into a nationwide movement. More than four million persons in our country are directly or indirectly interested in either household or auxiliary farms.

[Question] If we take the number of cooperatives as 100, what is the proportion? And what kind of categorization prevails?

[Answer] The two are related. A few years ago the economists established three categories (let me add in parenthesis: since then there have of course been many who took issue with this categorization). Those collective farms in



which the profits for 100 forint investment run under 6 forint are included in the under the average category. They number 437 from 1279. Where profits amount to 6-12 forint are considered as the average ones. Their number is 422. And in which profits are higher belong to the above average category. All this boils down to the fact that each group includes roughly one third of the Hungarian cooperative farms. But I wish to emphasize that within each group there are significant discrepancies. Fortunately so.

[Question] And how are the producer prices being formed?

[Answer] We form the agricultural prices on the basis of average natural and cropland conditions. Where the quality of the cropland is inferior to that standard, the cooperatives are receiving various subsidies. Since our goal is that every inch of land be tilled, we consider the continuation of these subsidies not only just but also as important on societal scale. Insofar as the cooperatives with above average cropland are concerned, we try to straighten out the economic imbalances in which we are living through various channels, for example by the application of land tax. I think this is self-evident. I agree with those letter-writers who suggest that unfavorable conditions should not offer safe conduct and that in such cases other requirements ought to prevail. Interest protection should prove to be capable to support efficiency, the successful work. For there are in our country agricultural cooperatives with good natural conditions which do not meet the expectations, while there are, at the same time, fortunately enough, cooperatives with rather unfavorable natural endowments which are nevertheless working efficiently and with profits.

[Question] It would be anachronistic to set, after so many years, the two peculiarly Hungarian agricultural producing system against each other. But we also have to realize that decades of cooperation, that we may call harmonious, raises always new and new tasks. On both sides. The small farms expect with good reason support, while also the cooperatives would like to get more profits from this cooperation.

[Answer] It was not recently that we started building a system of relations between the household farms and the big enterprises, but we have to constantly analyze our tasks during the course of development. There was a time, it can do no harm to remember it, when the number of cows in the household farms was restricted and it was prescribed how many sows can be held. We have got now so far that we stimulate the farmers to breed as many animals as they can, and we support the small farms, of course by guaranteeing their financial success. For, in the meantime the household and auxiliary farms grew into an independent economic branch and assumed a role of growing importance in the production of goods, particularly which require manual work, and in the exports. I am convinced that our agricultural policy wishes the strengthening of relations between the government, the household farms and the big agricultural enterprises. Our interest protecting activity is also geared to this. That there are tensions and concerns, is probably natural, but we continue to consider both the big enterprise and household-cooperative ownerships as equal partners. And inasmuch as our tasks are concerned in the area of interest protection, we do not consider satisfactory the interest shown by the big enterprises for the support of household and auxiliary farms. We have to promote this also with our own means.



# TABLES

## Numbers and Facts

1985.I.1

Number of Agricultural Producing Cooperatives	1,279
Persons in Important Positions	568,000
From them: Employees	170,000
Number of Old Age Pensioners	415,000

## Animal Husbandry (in the Agricultural Producing Cooperatives)

1973-1984

Cattle	46.9%	38.0%
Hogs	24.5%	27.9%
Sheep	5.9%	7.3%
Horses	1.2%	0.0%
Poultry	20.8%	25.6%
Other Animals	0.7%	1.2%

### Proportion of the Principal Branches

1973-1984

Basic Activity	77.6%	65.3%
From it: plant growing	48.3%	34.0%
animal husbandry	26.1%	23.4%
forestry services	3.2%	7.8%
Other than Basic Activity	22.4%	34.7%

### Social Composition of Small Farmer Households

Working Class	31.2%
Cooperative Peasantry	11.2%
Double Income Holders	8.9%
White Collar Workers	18.1%
Small Producers, Shop Keepers	3.7%
Old Age Pensioners	26.9%

### The Structure of the Agricultural Producing Cooperatives

On the Basis of the Balance Sheets

Plant Growing	34.1%
Animal Husbandry	24.0%
Auxiliary Activities	4.7%
Food Processing Industry	5.4%
Other Industrial Activities	14.7%
Other Activities	17.1%

12929/12312  
CSO: 2500/40

## DETAILS ON 1986 ANNUAL PLAN

Warsaw RZECZPOSPOLITA in Polish 26 Nov 85 p 1

[Text] Restoration of a balanced market, above all of a balance between disposable cash and commodity supplies, was named as the overriding goal of the 1986 Central Annual Plan (CAP) by Planning Commission Chairman and Deputy Premier Manfred Gorywoda during yesterday's news conference for Polish reporters at the Government Spokesman's Office. The conference was presided over by Government spokesman Jerzy Urban.

The 1986 CAP goals fit well into the 1986-90 National Socio-Economic Plan's objectives. The two plans are designed along similar lines and are subject to similar constraints. Production capital will increase only modestly. Employment will grow by only 120,000 people next year, and will even fall in the area of material production.

A comparison of two figures—one illustrating the growth of raw materials supplies by 1.7 percent, the other being the planned industrial output growth rate of 3.2-3.6 percent—shows how strongly the success of the 1986 CAP is dependent on efficiency improvement. The rates at which materials and energy are consumed during production definitely must be reduced.

Another main feature of next year's plan is a change in the proportion of investment to consumption in the national income, to the advantage of investment, compared with recent years. To halt the ageing of capital assets and to ensure sound industrial development, the Government resolved to grant priority to investment whilst also ensuring increased consumption. Investment spending is to grow by 4 percent, priority being granted to ventures expected to produce quick returns as they amount to purchases of machinery and equipment.

Investment policies will be closely linked with structural changes in all sectors and branches of the economy. Spending on research and development will also grow.

Consumption will grow 2.5 percent above this year's level on aggregate, and by 1.6 per person. As for consumer goods supplies, foods deliveries are to rise by 2.8 percent, other consumer goods by 2.3 percent, and the supply of services is to be larger than this year. While real wages are to remain at

this year's level, the structure of personal incomes is to change with a bias toward social security needs, above all the upgrading of old-age and disablement pensions planned for 1986. The 1986 CAP provides for a 29 percent increase in funds allocated for pensions, and this will result in a substantial (28 percent) growth in average nominal old-age and disablement pensions.

The large increases of recent years necessitate increased investment in social security facilities, especially in schools, kindergartens, and the health service. The 1986 CAP also provides for higher investment in construction, including housing. One remarkable change in this respect may come from a proposed new credit system for prospective home builders whereby credits are to be granted to individual housing cooperative members, not to the cooperatives as organizations. This is in response to widespread public demands and is now being scrutinized by the Housing Council.

The overriding CAP goal of restoring market equilibrium implies distinct progress in two areas, namely in the creation of a more balanced relation between disposable cash in private hands and the overall supply of market goods, and in exports (which are to grow by 8 percent) with a view to strengthen Poland's ability to service its foreign debt and to pay for indispensable imports.

To achieve the desired cash-commodity balance it is necessary, first, to check the upward drift of prices (by 1-1.5 percent compared with the 1985 price increase rate), and, second, to get personal incomes and spending under control in order to block the access of inflationary money to the market. The inflation gap, which may reach an estimated Zl 250-300 billion by the end of this year, is to be reduced to some Zl 100 billion by the end of December 1986.

Answering newsmen's questions, Corywoda and his deputy prynciezek Kubiczek said the Planning Commission had talked with the trade unions primarily about two things--the idea for what is called a "zero-level real wage growth" compared with the 1985 real wage level, and measures which should be taken to bring down inflation substantially. During work on the draft plan, the Planning Commission maintained close contacts with the All-Poland Trades Union Alliance OPZZ, complying with many suggestions submitted by special working groups appointed by them.

Setting up a close link between wage growth and increases in output and productivity, and the achievement of planned export growth rates, are the two key factors which will decide the success of the 1986 CAP. The recent modifications of the reform should help enterprises succeed in their pursuance of the plan targets.

/9274

CSO: 2020/46

## PLANNING COMMISSION ON 1986-90 FUEL, ENERGY SUPPLIES

Warsaw RZECZPOSPOLITA in Polish 20 Nov 85 p 2

[Text] On November 19, the President of the Government Planning Commission examined the revised provisions of the National Socio-Economic Plan for the years 1986-90, with special emphasis on fuels and energy supplies, and economies and investments in the fuel and energy industry.

The growth of fuel and energy supplies in the coming five-year period will be much slower than in preceding quinquenniums, and there will be essential changes in the structure of production. Whereas hard coal output will stay at an almost unchanged level throughout the five years, lignite extraction will rise 32 percent, the amount of electricity from lignite-fired plants will rise by about 38 percent and its share in the overall production in the power station network will rise from 29 percent this year to 36 percent.

This will be supplemented by increasing supplies of gas and electricity from the Soviet Union.

In view of the limited possibilities of increasing supplies, the balancing of demand and supply in the fuels and energy area calls for energetic efforts to achieve economies in their use. It is necessary to save about 21 million tons of coal equivalent in 1990 in order to be able to carry out the plans for the country's development.

The lowering of unit energy consumption will take place through the implementation of investment projects strictly defined in the National Plan, the use of powerful economic incentives to save fuels and energy and through suitable administrative moves.

It is planned to demand strict observance of state norms relating to energy consumption, broaden the scope of compulsory certification of products and equipment, ban the production of goods and the use of technology characterized by excessively high energy consumption. The lowering of unit energy consumption will be facilitated by changes in production structure, ever more widespread use of electronics, the growth of production of new materials, the development of advanced technological processes and the introduction of diesel engines in place of petrol-driven ones.



It was recognized that an active pricing policy, both with regard to production supply prices and retail prices, is one of the conditions for lowering energy consumption. This policy should seek to reflect faithfully the cost of obtaining fuel and energy and in this way introduce incentives for the rationalization of fuel and energy consumption.

This policy should also provide incentives for private households to limit the use of fuel and energy and replace coal, gas, coke and electricity with fuels such as lignite, wood or peat.

The Planning Commission Presidium emphasized that with fuels becoming increasingly difficult to obtain, maximum savings in their consumption are one of the supreme tasks for all economic organizations. Also the whole population must realize the importance of saving energy.

The Presidium discussed the outline of the investment program in the fuel and energy industry. The biggest part of the investment is to be channelled into the electricity generating industry. It is also assumed that almost all of this money will go into lignite mining and lignite-fired power plants. Due to limited funds, the growth of power generating capacity will be slow. Therefore it is all the more important to put the available funds to best use.

The meeting was chaired by Planning Commission Chairman, Vice Premier Manfred Gorywoda, and attended by Vice Premier Zbigniew Szalajda as well as senior officials of the ministries concerned.

/9274

CSO: 2020/46

## NATURAL GAS CONSUMPTION, SUPPLY OUTLOOK

Warsaw TRYBUNA LUDU in Polish 18 Nov 85 p 1

[Excerpts] Bogdan Mikolajczyk of TRYBUNA LUDU has talked to Jerzy Grzedowicz, director of the Natural Gas Authority, about the consumption of gas, the autumn and winter peak and the need to save gas.

"The daily gas supply forecasts which we prepare are addressed exclusively to industry," Grzedowicz said. "All the enterprises whose gas supplies are rationed are informed about the ration for the day by means of a 10-grade availability scale. The limit must not be exceeded on pain of fines or even the cutting off of the gas supply.

"Grade 1 means that the whole industry can use 22 million cu m of gas per day, Grade 5 is 18.6 cu m, and Grade 10--10.4 million.

"Gas is one of those production sources which have to be rationed because yearly supplies are short. These supplies consist of 6 billion cu m imported from the Soviet Union and approximately the same volume of domestic production, which is less than the potential demand. As the result of opening a gas line to the Police chemical works and supplying gas to newly built apartments, this year's deficit was expected to reach about 320 million cu m," said Grzedowicz.

Question: "And how big is it really going to be?"

Answer: "I said 'expected' because the planned deficit is largely an estimate. Gas supplies are like interconnected vessels, with apartments and municipal facilities being one vessel, and industry being the other. An average of 30 percent of all gas is consumed by apartments and municipal facilities, but this varies greatly with temperature.

For instance, in December apartments burn 2.5 times more gas (over 10 million cu m daily) than in July.

"Besides, apartments, hospitals, schools, canteens and the like have absolute priority as regards supplies. For both social and technical reasons, there is no rationing here; safety considerations preclude cut-offs. So one could say that the temperature determines both the volume of consumption and the proportions of distribution of this fuel."

Question: "We had a clear and costly proof of this in the first quarter of this year."

Answer: "Exactly. Various availability grades were in force at that time. Occasionally it was Grade 10 and even below for a period of a few days. As a result of the prolonged freezing temperatures, industry was short of about 250 million cu m of gas. The production losses on this score are still being made up, but I suppose that some of them are irreparable. If it hadn't been for the emergency reserve of gas stored in three underground tanks (170 million cu m), the deficit would have been even more severe and production delays would have been more serious."

Question: "During the summer we heard nothing of problems with gas, but were repeatedly told that industry wasn't using the increased supplies. What's the current situation?"

Answer: "During the second and third quarter of the year, industry could be certain of supplies of 3.8 billion cu m of gas. In practice it could have used even more thanks to higher production from the Tuliglowy deposit in southern Poland. It used about 3.3 billion cu m. Why? This question should be addressed to the chemical and metallurgical industries, which are the main users of gas."

"As it could still be possible to improve production results before the end of the year, we have decided to increase the supplies of gas to industry from 1.4 to 1.56 billion cu m in the last quarter of this year."

"The period preceding Christmas is usually the first peak season for the gas distribution system. We should remember this so that industry makes the most of every day with a Grade 1 level of gas availability."

Question: "The construction of the Kobrin-Brest-Warsaw gas pipeline will soon be completed. How is it going to influence gas supplies?"

Answer: "Owing to this gas pipeline, which is being built under an agreement with the Soviet Union, Poland's gas imports from the Soviet Union next year will grow by 1.1 billion cu m, to surpass 7 billion."

"This, together with the new domestic deposits Tarnow and Zalesie, will improve our situation. Gas distribution will also improve owing to a new underground tank Husow, with a capacity of 370 million cu. m, which will be completed in 1987."

Question: But this doesn't mean that we no longer have to save gas, does it?"

Answer: "Far from it--we have to use it even more economically. Inefficient use of a larger volume of resources immediately increases unjustified costs. Industry has the most say as regards rational gas consumption. But we could also save a lot in our apartments and other municipal facilities."

/9274

CSO: 2020/46

## RAILWAY CAR BOTTLENECK CAUSES EXAMINED

Warsaw TRYBUNA LUDU in Polish 25 Oct 85 p 3

[Article by Andrzej Kozminski: "Railway Cars as Precious as Ores"]

[Text] During the first three-quarters of this year Polish State Railways PKP refused over 8,600,000 tons of cargo, almost 5,000,000 tons of this for the sole reason that its wagons were kept over the proper time limit.

The metallurgical and engineering industries are the most unreliable in this respect. While engaging nearly 15 percent of the PKP transport, they are responsible for over 35 percent of all the wagons kept over time by all PKP users. Nearly 18 percent of those wagons kept for too long must be debited to foreign trade, above all in the parts.

The number of wagons kept beyond the time limit has been growing. This year it is almost 42 percent larger than in the comparable period last year, but, for example, the metallurgical, engineering, mining and power industries delayed twice as many wagons as in the last year. The construction and construction materials industries overkept over 65 percent more railway wagons, the chemical and light industries exceeded its previous number by half, and the forestry and timber industries, farming and food economy sectors by one-third.

The fines they paid on this account went well beyond 3 billion zloty, i.e. twice as much as they had paid last year.

## Behind the Factory Gate

It is worthwhile scrutinizing where those wagons were kept. First of all, by the "notorious in this respect" Lenin Steelmill in Cracow; the second, third and fourth on this "black list" are the Weglokoks branches in Czczecin, Gdansk and Swinoujscie, the fifth is the Beirut Steelmill in Czestochowa, the sixth is the Weglokoks branch in Gdynia, and the seventh is the Cellulose and Paper Mill in Wloclawek. Next come Hartwig forwarding agents at the parts, the Cellulose and Paper Mill at Swiecie and metallurgical plants.

This list has not altered for years except for slight changes in its order.



This suggests that the overkeeping of wagons usually does not result from their users' illwill or unsatisfactory organization of labor, but from some other more complex reasons. The enterprises are unable to overcome their difficulties with the railway wagons. Let us examine what happens to these wagons on the sidings of the railway's principal debtors who, despite paying PKP fines running into millions, still do not return them in time.

Since the beginning of this year Lenin Steelmill alone has overkept nearly one-fifth of all the wagons overkept by all wagon users. This is more than 20 times as many as the newer, Katowice Steelmill, although the Cracow mill has been given 3 hours longer than the one at Dabrowa Gornicza to unload their respective cargo. Fifteen hours are not enough for the Lenin Steelmill, while 12 are enough for Katowice, and Port North does not need even as many as 4 hours.

The above comparison provides at least a partial answer to the question, why does the Lenin mill hold so many wagons for so long? Its handling equipment is old, installed as early as in the 1950's, ineffective and, moreover, exploited and technologically obsolete. One cargo handling series requires several operations, so a breakdown of one element halts the whole process.

Janusz Razowski, Lenin's production manager, says that they could cope even with the obsolete technique and still considerably shorten the time wagons are delayed if it were not for a shortage of skilled manpower. For example, 30 steelmill-owned locomotives are idle. Maybe in the year's time they will be fit only for scrap, but at present they are still able to run. However, they need drivers and the steelmill is short of drivers, operators, and belt conveyor inspectors. The mill had them on its staff, but they left because their respective jobs were unremunerative.

However, in the Katowice mill the manpower problem is not so acute. Katowice's ore is discharged from wagons on so-called "dumping bridges," from where it is belt-conveyed to ore yards. Port North has even more modern and efficient equipment, but only for coal.

#### Wheeled Warehouses

In the other ports Weglokoks' "wheeled coal warehouses" take up many tracks--the lack of ships causes wagons to be delayed, while a lack of wagons keeps ships beyond the proper time. It's a vicious circle.

The wagons should wait for ships, because car demurrages cause zloty losses, while those of ships involve hard currency. Yet what can be done if there aren't enough wagons, and, if those that are there, are not sent to mines in time--miners stop producing and ships have to wait for the coal anyway?

In this way hundreds of wagons stand idle in ports. Those which stand idle for the longest are the ones loaded with the coal stevedores and railwaymen call "a drug on the market." Despite appearances, this is the highest quality coal in blocks, which must not be stored otherwise it will lose its quality. Other coal lies in wagons waiting to be loaded onto ships because the respective port cannot transship it to its own depot.



Polish ports contain yards for storing small and coking coals, but not the several kinds of nut coal or, the most precious, coarse coal. Ore yards are not spacious enough either. The North Port of Gdansk could very well do with an ore-handling terminal, but its construction has been discontinued.

Stevedoring facilities in other ports are also unsatisfactory.

In freezing conditions, the situation becomes acute. As a rule, the separation of coal from stone in the mines is done in wet scrubbers. When frost follows rain or thaw, ore and stone freeze even in railway wagons.

Ports, power plants and others lack defrosting rooms. The rooms they have are able to treat a mere half of the coal-loaded wagons arriving.

Despite all the tests, Poland does not yet have chemical agents able to prevent the freezing of cargo in temperatures below 10°C, although these would be cheaper than the costly defrosting rooms, which use large amounts of fuel and, moreover, pollute the air. Thus, Poland is doomed to crowbars and pick-axes, which make the unloading of wagons a lengthy business and, moreover, damage the wagons.

What's the Aim of Fines?

All railway wagon users, with the exception of small plants and enterprises, keep far too many over-long and, what is worse, keep increasingly more of them. Even the small firms, taken together, keep as many as 15 percent of the delayed wagons, and although during the first three-quarters of this year they were responsible for nearly 19 percent less than last year, yet in eight months this decline amounted to only 5.5 percent.

What happened in September? In September, PKP tripled the fines on delayed deliveries of its wagons. This has been effective in regard to small plants, and enterprises, because the fines become a burden on these firms' inconsiderable profits, thus threatening the workers' bonuses.

However, the fines hardly affect the profits of large plants and enterprises and thus are not severe enough to make much difference to these firms' cashiers or workers!

The only exception is the Lenin Steelmill, which delays the largest number of wagons nationwide (over three times as many as the second on this "black list," Weglokoks of Szczecin). Lenin's expected profit this year is estimated at 10 billion zloty and the fines--at well over half a billion! This burden of more than 5 percent of the profit means a lot even to as huge an enterprise as the Lenin Steelmill.

This exception, however, only proves the rule, perhaps it would be advisable to introduce progressive fines not only on the amount of overdue time, but on the number of overdue wagons as well?

Obviously the fines should perform two tasks: first, they should induce the PKP customers to return the wagons promptly, and second, they should stimulate the mechanization of cargo handling, which in Poland (where the number of transshipments is, relatively, one of the world's highest) is only in its infancy.

/9274

CSO: 2020/46

## BRIEFS

**SOVIET RAIL EQUIPMENT TO POLAND**--On November 22, a contract was signed between the Kolmex foreign trade company and the Soviet foreign trade firm Energomaszeksport for deliveries of Soviet rolling stock, rail machinery, and components for the production of railway cars from the Soviet Union in 1986. Poland will import 27, 1200 h.p. shunting locomotives, 6,200 H.P. heavy locomotives, 3 machines for constructing and repairing rails, 5,000 wheels and 12,000 wheel sets for use in the production of railway wagons from the Soviet Union. The value of these goods imported from the USSR will total 38 million transfer roubles. [Text] [Warsaw RZECZPOSPOLITA in Polish 25 Nov 85 p 5] /9274

**POLISH-JAPANESE TRADE TALKS**--A Polish-Japanese commission, operating under a Polish-Japanese agreement on trade and navigation, has held a plenary meeting in Tokyo. The negotiating groups were headed by Polish keputy Foreign Trade Minister Antoni Karas and Japanese Deputy Foreign Minister Shinichi Yanai. The two sides discussed the economic relations between the two countries and conditions for the further development of trade and industrial cooperation. The meeting, the first one in four years, shows that both sides wish to encourage two-way trade and enrich its structure. [Text] [Warsaw RZECZPOSPOLITA in Polisy 18 Nov 85 p 1] /9274

CSO: 2020/46

## STATUS OF PRODUCTION, EXPORTS IN CHEMICAL INDUSTRY

Bucharest REVISTA ECONOMICA in Romanian No 41, 11 Oct 85 pp 9-10

[Article by Ioan Georgescu]

[Text] Another branch which is to present a rich supply for export during the 11th Bucharest International Fair is the chemical industry.

Romania currently is among the top 10 world producers in volume of production in the chemistry branch. At the same time, this branch's share in the value of Romania's industrial production and in the volume of exports currently has risen to 15 and 25 percent, respectively, with chemical products being among the first groups of export goods. In the last 20 years alone more than 1,800 new production capacities have been built in various subbranches of chemistry. Units representative of this branch are the petrochemical combines in Pitesti, Borzesti, Ploiesti, Teleajen, Rimnicu Vilcea, Midia, and Timisoara; the chemical fertilizer combines in Craiova, Piatra Neamt, Tirgu Mures, Turnu Magurele, Navodari, Arad, Slobozia, Bacau; the sodium products combines in Govora, Rimnicu Vilcea, Giurgiu, Ocna Mures; the artificial and synthetic fiber enterprises in Braila, Popesti Leordeni, Savinesti, Suceava, Dej, Cimpulung Muscel, Iasi, Roman, Vaslui; the plastic-processing enterprises in Bucharest, Buzau, Iasi, Focsani, Bistrita; the tire enterprises in Bucharest, Floresti, Zalau, Drobeta-Turnu Severin; the combines and enterprises for technical articles made of rubber in Bucharest, Pitesti, Tirgu Jiu, Botosani; the pharmaceutical enterprises in Bucharest, Iasi, Cluj-Napoca; the cosmetics enterprises in Bucharest, Cluj-Napoca, Brasov; the dyes, paints and varnishes enterprises in Codlea, Timisoara, Bucharest, Oradea and so forth.

One may say that Romania's chemical industry to a great extent has created its own conditions for development by utilizing the opportunities which modern chemistry has available for the chemical change of raw materials, particularly the petroleum ones, in the production of polymers, synthetic products which in turn have brought industrial processes for later processing. The basic products themselves in the last two decades have seen rapid growth rates. The production of sulphuric acid has risen 3.6 times, ammoniac--11.6 times, chemical fertilizers--9.8 times, methanol--8.4 times, synthetic rubber--4.8 times, detergents--5.3 times, dyes and organic pigments--2.3 times, primary aluminum and aluminum alloys--25 times.

A major contribution to these achievements has been made by the permanent promoting of the scientific-technical revolution in this sector through the research

activity carried out in the Central Chemical Research Institute, which brings together more than 30,000 research cadres from 27 units for scientific research and design. This means that in the current five-year plan around 95 percent of the chemical industry's production is taking place on the basis of original technologies worked out in the laboratories of the research units belonging to the central chemical research institute. In accordance with the priority programs for development of the Romanian economy, there are intense research concerns with obtaining materials of high purity and with the superior physical characteristics required in the area of peak technology, such as electronics, aeronautics, nuclear power, with a portion of these being obtained even in the research units, in the microproduction sectors. It is forecast that by 1990 more than 1,800 new products will be obtained in this way. Another basic orientation for research is deepening the degree of processing of raw materials by building new installations capable of producing superior varieties, particularly in petrochemistry, such as synthetic fibers and wires of high quality, new dyes, new types of rubber and latex, new pesticides, new plastics and so forth.

The powerful development of Romania's chemical industry has also placed on the international market the products of this branch, with more than 700 products currently being delivered through around 1,200 partner firms in more than 110 countries, both industrialized and the developing countries. An analysis of the evolution of the export listings in recent decades shows the deep qualitative changes. The range of exported products has become very diversified, with the share of basic products falling together with the rise in the share of products of fine synthesis and low-tonnage chemistry. More and more original technologies, equipment and technological installations for the chemical industry also have been exported.

Low-tonnage chemistry currently holds around a 50-percent share of total volume of exports of chemical products. The 23 fine-synthesis chemistry units are joined in the Industrial Central for Drugs, Cosmetics, Dyes and Paints. Among these primarily should be mentioned the Bucharest, Iasi and Cluj-Napoca pharmaceutical enterprises, which obtain more than 130 active substances, from which 1,100 pharmaceutical preparations belonging to all the groups of known drugs are obtained. In this way the chemical industry has succeeded in covering 85 percent of the domestic need for drugs. Most of the drugs are the result of the original research of Romanian scientists with international reputations, drugs which have proven high therapeutic effectiveness. Also, obtaining the drugs has been done in cooperation with foreign firms with broad experience in the area and well thought of in the market.

Among the original Romanian drugs, the range of Gerovital H<sub>2</sub> (R) and Aslavital (R) is well known both in Romania as well as abroad. These drugs are very much in mind for export due to their effectiveness in treating chronic degenerative diseases and the phenomena of aging. The original drug Boicil Forte (R) has given spectacular results in the treatment of rheumatism and circulatory disorders. Covalitinul (R), Ulcosilvanilul (R) and Trofopharul (R) are new Romanian drugs which have asserted themselves at the international level in the treatment of such serious illnesses as renal lithiasis, ulcers and chronic hepatitis. The research of Romanian specialists in the area of drugs currently is being concentrated on synthesis and biosynthesis of new products on the basis of vegetable extracts or animal products in accordance with recent orientations of science.



Another sector of low-tonnage chemistry is the production of cosmetics, perfume products, soaps and detergents. The three big cosmetics factories--Miraj in Bucharest, Farmec in Cluj-Napoca and Nivea in Brasov--currently produce a range of more than 800 kinds of cosmetics and perfume products, with the largest portion produced on the basis of extracts of vegetables and fruits, sapropelic muds and so forth. For example, the range of Belatrix cosmetics is prepared from extracts of plants with a cardiotonic effect, recommended for activating peripheral blood circulation, the Bioton range has at its base animal extracts with a regenerative effect on the epiderma, the Pell Amar range utilizes muds from the well-known Amara spa in cosmetics with a softening, protective effect. On the basis of various vegetable extracts--algae, wild strawberries, camomile, peaches--are prepared the cosmetics Dermin, Anca, Farmec, Magnolia.

The detergent enterprises in Ploiesti and Timisoara produce a diverse assortment of soaps and detergents for hand and automatic washing for cottons, silks, wool or synthetics. The chemical industry has provided the various requirements for dyes for various contexts of synthetic fibers (polyester, acrylonitrilics and so forth) with an appropriate variety of organic dispersion dyes. At the same time pigments are being produced for plastics, typographic inks, varnishes and paints. About 80 percent of the textile industry's needs for dyes are being covered by Romania's chemical industry. The main producers of dyes, varnishes, paints, pigments and synthetic resins are the Policolor enterprise in Bucharest, Azur in Timisoara and Sinteza in Oradea.

As far as the palette of paints and varnishes are concerned, concerns presently are being directed on a priority basis toward synthetic resins, which provide a superior quality of protection and permit use of modern procedures of application. The Azur enterprise alone produces 2,500 types of varnishes and paints and more than 800 types of typographic inks. In accordance with the areas of usage and procedures for application, we are producing paints which dry in air or in ovens for furniture, for building, for corrosive environments, for metal packaging, for softening vibrations and for sound insulating and so forth. This powerful diversification (more than 10,000 kinds of products of fine synthesis), in accordance with the more and more diverse requirements of the economy and of the foreign beneficiaries, is supported by a powerful research force of the central, which, on request, also provides technical assistance to the beneficiary. For example, the research center for anticorrosion protection provides technical assistance to domestic and foreign beneficiaries, recommending substances and coverage procedures depending on the products and stage of application.

Remaining in the area of low-tonnage chemistry, we should make special mention of the photographic products produced at the Azomures Chemical Combine in Tirgu Mures, which currently is producing a varied range of photographic materials, such as medical films for X-rays, technical films for X-rays, photographic materials for graphic arts, materials for photogrammetry, movie films, materials for amateur photographers.

The activity of applicational scientific research has made a valuable contribution to the rationalization of imports. In 1983 alone the chemical industry research laboratories produced more than 1,300 products and new materials for the other industrial branches, ones which at the same time enrich the export supply. We mention a number of intermediary products for the textile industry of leather, paper, glass and so forth, such as Barium Selenit for the glass industry,

Avivaj N and GFL Emolient for finishing of threads and fabrics in the wool and artificial fibers industry, Romegal (CB and CM) for processing of synthetic fibers, Torsital NFO for processing of wool thread and cellulose in the knitwear industry, Catiotim M for leather processing, Prepatim P for processing of wool and polyester mixtures, Aldet for washing in the textile industry and degreasing in the leather industry and so forth.

The export supply of Romanian industry also includes technologies as engineering or incorporated into the equipment (deliveries to the docks ) in the following areas: transformation of oil industry, the chemical fibers and wire industry, the petrochemical industry, the pharmaceutical industry (synthesis and conditioning), the industry for transformation of plastics and rubber, the inorganic chemistry and fertilizer industry, organic synthesis (furaldehyde, adhesives and so forth) and other subbranches (varnishes and paints, hydrocarbons, anticorrosion protection).

Cooperation in carrying out projects on the dock with firms which are internationally famous such as the Institut Francais du Petrole, Petrolite (France), UOP, Parsons (United States), Camprimo, Kinetics Technology International BV (Netherlands) and so forth has contributed to lining up the Romanian export supply with the highest requirements of the world market and the accumulating of vast technical experience. Romanian equipment in refinery construction is at the technical level recorded by innovative firms such as Lurgi, Hydrocarbon Research, Inc., Krupp Koppers and so forth. The quality of installations produced abroad also is certified by specialized checking organs in countries such as TU (GDR), TUV (GFR), Gapave (France), Kotonadzor (USSR). Both the Romanian standards ISCIR and the American ASME, TEMA, API, the Soviet Gosgortekhnadzor, AD-Merkblatter and so forth are respected in working out engineering--the execution designs.

Commercial references on the quality of projects built by the Industrialexport, the Romanian foreign trade firm, abroad may be obtained easily, bearing in mind the comprehensive list of installations currently operating in various countries, such as the atmospheric distillation installation in GDR, the installation to manufacture lubricating oils in the CPR, the Vitamin C manufacturing installation in the KPDR, the installation for calcinate soda and caustic soda in Egypt, the sodium chloride electrolysis installation in Hungary, the complex of installations for lubricating oils in Haldia, the sulphur dioxide refining installation in Barauni, the Gauhati refinery in India, the refineries in Jordan, Syria, Pakistan, Egypt, Turkey, Yugoslavia and so forth, the formalin installations in the USSR, the sulphuric acid and superphosphates installations in Turkey, the tanin extraction installation in Vietnam and many others.

Of course, chemistry's export program which is to be presented during the current edition of the Bucharest International Fair is much broader than space permit us here, so in this way we invite this magazine's readers to get to know the innovations in each subbranch in person at the chemical industry booths at the Bucharest International Fair '85.

8071

CSO: 2700/26

## TECHNOLOGIES FOR INCREASED USE OF REUSABLE RESOURCES

Bucharest REVISTA ECONOMICA in Romanian No 41, 11 Oct 85 p 4

[Article by Ioan Nedelcu of Timisoara]

[Text] The overall concerns for carrying out activity in all economic units under good conditions include as one of the basic conditions for ensuring the continuity and steady rate of the production process also the ones aimed at creating the conditions needed for efficient flow of the mechanism for material-technical supply. The methods and means of action are diverse and the concerns for superior utilization of reusable resources have seen particular scope recently as a result of the positive effects they generate and this has occurred through adopting more and more improved techniques for the recovery, reconditioning and reuse in production processes. The numerous studies made both here in Romania as well as in other countries bring out the particular efficiency of the actions to utilize reusable resources, with the values being truly impressive: the production of one ton of steel from old iron instead of ore is being achieved with a savings of 178 liters of crude oil, while in the case of copper and aluminum this is at 922 and 3,451 liters, respectively; paper recycling reduces energy consumption in the paper and cardboard industry 50 percent.

Concerns in this area in Romania, guided and permanently oriented by the party's secretary general, Comrade Nicolae Ceausescu, have aimed and continue to be aimed at ensuring an adequate framework for carrying out the activities imposed by the process of reutilization of reusable resources so that they ensure total recovery of these resources and their reuse through the most efficient technologies. As a result, also involved in these activities today are the economic units where, following the production process, these resources result, as well as institutes and centers for scientific research and technological engineering, economic centrals and ministries and the population. As a result of the orientations and guidelines drawn by Comrade Nicolae Ceausescu, the activity for recovery and reconditioning today has an adequate organizational structure, in accordance with the requirements in this area and represented by the Central for Recovery and Utilization of Reusable Materials in Bucharest and the county enterprises under it.

The increase in the need for raw materials and materials of the national economy--in accordance with the rise and diversification, quantitative and qualitative, of the production of all branches--on one hand and stress on the restrictive nature of the raw material resources on the other require growth in the contribution of reusable materials in providing resources for material-technical supply.



The existing organizational framework, the degree of supply of the enterprises, the measures taken along the party and state line in this area and the results obtained until now are capable of creating all the conditions needed to raise the activity of recovery and reutilization of reusable resources to new levels of efficiency. There still are large resources in the economy which await re-introduction into the production circuit and whose full and efficient utilization depend only on superior mobilization of all the factors involved in this process.

So, what must be kept in mind to a greater extent are the recovery and recycling of the metals contained in used subassemblies and electric and electrotechnical products, particularly bearing in mind that these are rare or precious metals in appreciable quantities.

In referring to the recovery of metals it must be pointed out that currently old iron, with an additive, has become an indispensable material for the iron and steel enterprises, requiring improvement in all the activities involved with its reutilization: collection, sorting, preparation and expediting to the beneficiaries. A new quality in the work of recovery and utilization of old iron as well as all reusable materials means permanently providing collection by varieties and chemical composition so that there is maximum reduction of the possibility of impurification of the batches and that in the end the anticipated savings of hydrocarbons, energy and ores are obtained.

Greater attention in the action to utilize old iron should be given to its chemical recycling and utilization of rust in the manufacturing process of certain pigments which is so necessary for the chemical industry and for the obtaining of which we many times turn to imports. We feel that research in this direction cannot be without interest, research which would propose to establish adequate techniques of recovery and reuse as well as the designing of necessary installations.

Along another line of idea, we wish to show that what is needed, also for improving the process of introducing reusable metals into economic circulation, is to adopt certain measures and actions intended to eliminate the reserves still persisting in the enterprises about utilizing metal chips. The methods for re-using them now being used do not provide total elimination of the difficulties connected with this process: the metal chips have low density, a fact which means that it would be hard to load them into the trucks and to transport them, and that the transport capabilities would not be used to the maximum; upon the remelting, 30 percent at most of the crushed chips are burned. All these shortcomings can be eliminated by moving to a greater extent to utilization of briquetting installations for preparing them through electroagglomeration, without previous size reduction (the briquetting process last just 3 minutes at a temperature of 700°C). In this way we can provide a growth in efficiency of the activity for recovering these chips parallel with having the consumer units obtain large energy savings.

Also through a chemical procedure, without expensive implications, we also can provide the quantities of zinc contained in different parts, subassemblies or used products which are recovered and reused. Also, these dezincing baths have existed in the supply of the former ICM units, however, for reasons which are hard to understand, they gave up using them. Special attention must continue to be given also to the recovery of rare metals (whose resources at the world level continue to fall), such as aluminum, tin, chromium, nickel, wolfram.

## INCREASED PRODUCTION IN WOOD INDUSTRY

Bucharest REVISTA ECONOMICA in Romanian No 41, 11 Oct 85 p 3

[Article by Rodica Mirotu]

[Text] The broad process of Romania's economic growth in the last two decades also has involved the tumultuous development of the industry for exploiting and processing wood, cellulose and paper. Bearing in mind the particularly complex tasks belonging to this branch in the current stage and taking into account the general narrowing of the base of raw materials in the area of wood exploitation and processing, there is special importance in the specific problems connected with increasing production and labor productivity, with increasing the degree of utilization of raw materials, fuels and energy and of promoting technical progress.

## Structural Changes in the Evolution of Production

Evolution of the industry for exploitation and processing of wood, particularly in the period following the 9th party congress, has been characterized by a sustained growth rate of industrial production, averaging 5.9 percent, so that 1983's production exceeded the achievement of 1965 by nearly 2.8 times (we should note the high contribution of the subbranch of wood processing, whose production rose 3.5 times). As a result, the degree of participation of this industry in carrying out total industrial production has risen continually, representing 4 percent at the 1983 level. The rise in value production of the branch was achieved both by diversification of the range of products being manufactured as well as by increasing the share of products of a high technical and quality level. The continually rising development of the wood-processing industry has been supported by a broad investment effort, bearing in mind the need for corresponding development of the production forces and obtaining the highest possible economic efficiency; the volume of investments allocated in 1983 was 1.66 times higher than in 1965.

Proceeding from this potential and from the requirement for Romania's most active possible integration in the world circulation of values, this branch has a growing participation in exports both from the viewpoint of volume of products delivered to the foreign market as well as the range of varieties offered. The structure of Romanian exports of wood products presents a favorable situation, bearing in mind both the high share held by furniture as well as the low share



of round timber. In this regard we should point out that Romania is among the top 25 countries which export wood products, not counting furniture, while it is in 9th place for furniture exports--a product which ensures a high utilization of wood--with approximately a 4-percent share in world exports. It should be noted that, in the case of exports of period furniture, currency receipts per unit of wood consumed are being obtained which are nearly 2.3 times higher than the exports of doors-windows, 4 times greater than exports of beech plywood and 6.3, 10 and 17 times higher than the exports of resinous converted timber, fiberboard and round timber, respectively.

#### Technical Progress-Creativity-Efficiency

The introduction and generalization of technical progress, particularly the application of new manufacturing techniques, and the mechanization and automation of production--which have required supplying the branches with high-output machinery and installations as well as the modernization of existing ones--and ensuring the appropriate level of training and qualifications of the labor force have been the main means for increasing the efficiency of utilizing technical, human and material potential. The use of material and energy resources with greater efficiency and obtaining the highest values possible per unit of processed raw material or per unit of energy consumed, as a result of promoting new or modernized products and techniques into manufacture, are one of the basic requirements for the enterprises in this sector of activity.

In accordance with the program for more emphatic growth in labor productivity and improvement in the organization and standardizing of work up to the end of the 1983-1985 period, 370 new and improved techniques have been applied in the branch of wood exploitation and processing, seeking through this the rise in degree of high utilization of wood, chemification of wood and modernization of the techniques for exploitation and transport. The permanent attention given to the most sensible and efficient possible use of wood is seen specifically in the 1965-1984 period in the growth in the indicator of use of this resource of more than 23.5 percent as well as in its degree of utilization of 4.25 times. Through development and intensification of the wood-chemification process it is estimated that a much more diversified range of products will be obtained in 1985 compared with 1965 (charcoal, tannic acid, furaldehyde, methanol, fodder yeast, essential oil, juniper flour, compost), valued at 3.5 times more. Other actions are aimed at extending processing the centers for sorting and industrialization of wood, redesign of furniture on the basis of boards and converted timber of lower width, diversification of the production of wood-chip boards and replacing wood veneers with plastic foils and so forth.

In the process of manufacturing cellulose, in order to reduce specific consumption measures have been taken for increasing the degree of recovery of fibrous material from heavy water by improving its recirculation. In the coming period, with a view to providing the cellulose and paper industry as fully as possible with wood, along with increasing the percentage of recoverable and reusable materials, it is forecast to use deciduous wood for cellulose to a greater extent. Also, we are continuing to seek an increase in the percentage of paper used, which should reach 45 percent of total raw materials for the production of paper and cardboard. At the same time, in order to cover the consumption of wood, vegetable resources, other than wood, particularly straw, have been used to

cover consumption of wood. These resources by the end of 1985 will represent an equivalent of wood which is double that of 1980.

#### Long-Range Priority Goals

The industry for exploitation and processing of wood is to continue developing due to better utilization of wood. In this regard, the Directives of the 13th party congress provide for respecting the measures adopted by the National Program for Conservation and Development of the Forests in the 1976-2010 Period with regard to the volume of wood for industrial production, placing the emphasis on raising the technical and quality level of products so that we ensure broader export opportunities for Romania. So furniture production, which is to increase 12-16 percent by 1990 compared with 1983, is to be oriented in particular toward high-quality varieties, with the value of furniture production obtained from one cubic meter of wood to increase 1.5 times in 1990 over 1982. New types of textured esthetic veneers, colored, thin, will be assimilated as well as woodchip boards made with the new techniques.

Action is to be taken in the cellulose and paper industry to reduce specific consumption, together with reducing weight, increasing the proportion of reusable materials as well as to have a more emphatic growth in production of special and technical paper and cardboard; it is forecast that paper and cardboard production should increase 9-15 percent by 1990 compared with 1985.

The techniques applied in 1983-1985 will be generalized in stages during the 1986-1990 period in all units as well as measures for the mechanization of those operations which are difficult and those with a high volume of labor (sorting and processing of wood, sizing-pressing at the board plants and so forth). Also, new improved techniques will be worked out for manufacturing furniture from panels veneered by sizing and folding, for cutting round timber and for collecting wood from the highly-sloped areas, by using highly-efficient installations. The application of these high-output techniques as well as measures to improve and organize production and labor will lead to a growth in labor productivity of more than 1.9 times in the next five-year plan in the industry for exploitation and processing wood and paper products.

Of course, fulfillment of these very important tasks means maximum mobilization and involvement of all forces in the direction of carrying out the programs to improve the technical and quality level, to reduce the consumption of raw materials, fuels and energy and to have high utilization of raw materials and a more emphatic growth in labor productivity.

8071

CSO: 2700/26

## MEASURES TO INCREASE POULTRY PRODUCTION

Bucharest REVISTA ECONOMICA in Romanian No 41, 11 Oct 85 p 5, 6, 22

[Article by Viorel Chirita, director, and Gheorghe Olteanu, head economist, Crevedia State Poultry Raising Enterprise]

[Text] Providing high technical-economic parameters is a demand for all the zoo-technical enterprises and farms specializing in poultry production. Speeding up the growth rate of production is indissolubly linked with technological problems and the ones on organization of production and labor. The subbranch in which the nature of the production process comes closest to the specific nature of the work in industry, poultry raising has seen a powerful growth.

The 1986-1990 five-year plan will continue to provide the intensive development and modernization of all of agriculture. A special emphasis is to be placed on the development of zootechny, which by 1990 will hold a 46-48-percent share of total agricultural production of Romania. Along with the substantial increase in number of cattle, hogs and sheep, the number of chickens will hold a special place: the number of layers will reach 80 million. Together with the rapid development of zootechny in the socialist sector of agriculture--which will continue to represent the main share--more attention is to be given to the development of this branch in the population's plots. Important changes will be recorded in the area of poultry-raising efficiency. In 1990 average production will be 220-225 eggs per hen, which will contribute to reaching a total production of around 9-9.5 trillion eggs, that is, 12-19 percent more than the average of 1981-1985; the production of chicken meat also will rise.

Deep changes in the development and modernization of Romanian agriculture have created favorable conditions for the organization of a large number of poultry farms and enterprises, the application of progressive techniques on them for raising and feeding them and combatting disease, providing a steady rate in obtaining the products, keeping them in good condition and preserving them and well as utilizing them under good conditions and at profitable prices. All this has contributed to the rise in egg and chicken-meat production, with a view to satisfying the population's demands. Fulfillment of this task has become possible as a result of the organization and development of poultry raising in Romania year after year. Whereas in 1951 the total number of chickens was just 17,610,000, in 1984 the number reached 119,237,000. What is characteristic is

the fact that whereas the layers during the year referred to represented around 73 percent of total chickens, at the beginning of last year this was reduced to just 38 percent, despite the fact that in absolute proportions their number increased more than 3.5 times. The explanation lies in the fact that, parallel with the development of the egg-production sector, there was a faster rate in the sector for production of chicken meat as a result of increasing needs and improvement in the structure of supplying the population. At the same time, there was a rise in the share of improved and specialized poultry breeds for high production of eggs and meat.

The increase in numbers and creation of farms and poultry combines would not have been possible without a powerful network of incubation stations. They were organized for the purpose of providing the necessary number of day-old chicks for those units which do not have available their own incubation base, so a powerful base for development of poultry raising has been created.

Raising poultry on big farms as well as in combines and industrial poultry-raising complexes which provide for the rise in production of eggs and meat and quick recovery of investments, is an unprecedented achievement in Romania's poultry raising. The industrial poultry-raising complexes are noted by the mechanization and broad automation of jobs in the halls, the scientific organization of technological flow in poultry raising and use of combined fodders, which lead to the growth in labor productivity, to reduction in production cost, with positive effects on carrying out the process of self-leadership and economic-financial self-management of the particular enterprises. For that reason a very important role in the development of this zootechny sector is played by the agricultural units specializing in egg or meat production.

One of the oldest and, at the same time, most modern poultry-raising units in Romania is the Crevedia State Poultry-Raising Enterprise (Dimbovita County). Preferentially organized for raising and fattening chicks for meat production, the activity of the unit mentioned year after year has helped in obtaining large profits. Besides the chicks for meat, other production sectors of the enterprise concern reproduction of heavy and light breeds, incubation, duck-raising. Year after year the volume of production has risen continually. Last year the material and human efforts of the entire collective were seen in large increases in production and in the economic-financial results (see table). The circulating number of chicks for meat rose 30.3 percent over the planned level, an increase also seen in the additional meat production. This fact is brought out by the increases obtained in the area of additional production (around 6 percent). An average production of 205 eggs per hen was obtained in the sector for reproduction of heavy breeds, which represents 9 percent more than the level planned for this indicator. Large increases also were achieved in the incubation process, achieving 16.6 percent more day-old chicks than planned. Parallel with the constant concerns of the specialists with increasing production and the profitability of the sector for heavy breeds, the Crevedia state Poultry-Raising Enterprise gave the same importance to the sector for reproduction of light breeds. There is special priority in increasing the number of hens from the light breeds and increasing the average egg production per hen. Against the backdrop of the high levels of these indicators (exceeding the number by 12.3 percent and average production by 4.3 percent), the production activity of the sector for light breeds last year recorded a substantial growth, seen in a large



increase in economic-financial results. For the enterprise as a whole, the incomes obtained from the basic activity rose around 13 percent over the planned level, with the increase primarily due to the high level of production.

Situation for 1984 Plan Fulfillment  
At the Crevedia State Poultry-Raising Enterprise

	Plan	Achieved	% Over Plan
Circulating number of chicks for meat	5,831,000	7,599,000	130.3
Additional production (tons)	6,160	6,526	105.9
<b>Reproduction-heavy breeds</b>			
Average egg production per hen	188	205	109.0
Incubation of day-old chicks	10,566,000	12,317,000	116.6
<b>Reproduction-light breeds</b>			
Egg production	14,486,000	16,941,000	116.9
Average number	61,642	69,232	112.3
Average egg production per hen	235	245	104.3
Financial result (lei)	2,000,000	3,111,000	155.6
Incubation of day-old chicks	3,200,000	3,973,000	124.2
Percentage of (chicks per 100 entries)	37.6	41.6	110.6
<b>At the enterprise level</b>			
Income from basic activity(lei)	374,695,000	421,355,000	112.5
Production good (lei)	155,890,000	193,278,000	124.0

Looking at all these technical-economic results, we see that obtaining bigger production and more efficient production is possible to accomplish primarily through appropriate foddering of the poultry. For that reason, qualitative improvement in the fodder rations is keenly needed. Whereas in other areas of zootechny (especially the chewers), the effect of substituting certain types of fodders is easier to do without having significant effects on production, in poultry raising for eggs and meat the optimum conditions for feeding are determined. Extending and generalizing industrial systems for raising poultry have made it necessary to introduce new techniques not only for raising but also for their foddering. Moving to the use of combined fodders makes it possible to ease the work of distributing and handling them, together with creating opportunities for balanced feeding of the poultry depending on the production anticipated to be obtained. Obtaining big increases in raising and fattening, parallel with providing good states of health for the poultry mean continuing to administer fodders rich in vitamins, microelements and balanced protein sources which provide the biological need for production and reproduction. Reducing the protein content, for example, creates serious problems in obtaining appropriate production results. Unfortunately such deficiencies exist very often in the fodder method in poultry raising. The consequence of failing to respect the fodder recipes is obtaining small and inefficient egg and meat production. So it is necessary in all the agricultural units raising poultry to provide the necessary fodder under optimum conditions not only as far as quantities but also as far as quality is concerned, absolutely indispensable elements in obtaining high and constant poultry production--a basic task established by the party and state leadership of these units.



Against the backdrop of the general mobilization of all workers in agriculture for increasing production, efficient measures have been taken and continue to be taken in this regard at the Crevedia state Poultry-Raising Enterprise, too. Among the most important, we can mention the appropriate sanitary conditions in all the halls and equipment for each new series of birds; providing the appropriate quantitative and qualitative combined fodders; maximum use of production areas, providing appropriate optimum density for the birds; strengthening the veterinary health protection of the poultry; full use of the fodder base with a view to increasing fodder production; the transporting, storage and use of waste and liquid waste, prohibiting their spread; daily checking on the veterinary health state of the poultry and of production; extending the use of horse-drawn light trucks at the farm level; rationalizing the consumption of fuels and energy; full utilization of incubable egg production with a view to obtaining a high number of day-old chicks; extending the raising of ducklings to obtain larger quantities of meat per unit of area; reducing expenses with drugs; carrying out most vaccinations with aerosols; mechanization of waste removal by supplying the farms with M-400 tractors with blades; checking on the quality of fodder through lab controls carried out both in the plant's laboratory as well as neutral laboratories; respecting the diet for the chicks delivered to the slaughter house and so forth.

All this will permit us to continue obtaining high technical- economic results capable of contributing to the strengthening of economic-financial self-management of the enterprise, and the material support for future development of egg and chicken production. The expression of the measures mentioned above already has been seen in the economic-technical results which are higher than those obtained last year , with large increases being recorded for all indicators. Generalization of progressive experiences in this area, reduction of energy consumption will permit greater independence in the enterprise's operation and in reaching the levels of future production resulting from the tasks drawn in this area by the party and state documents.

8071

CSO: 2700/26

## SLOVENE LC FORUM DISCUSSES ECONOMY, LC MEMBERSHIP

LD150008 Belgrade TANJUG Domestic Service in Serbo-Croatian 1603 GMT 13 Nov 85

[Text] Ljubljana, 13 Nov (TANJUG)--In its economic relations with foreign countries Slovenia will this year realize \$460 million surplus. This was pointed out by Dusan Sinigoj, president of the Republican Executive Council, at a meeting of the secretaries of the presidiums and town committees of the Slovene LC and the secretaries of intermunicipal councils of the Slovene LC, in connection with topical socioeconomic relations in the republic.

The surplus from Slovenia constitutes two-thirds of the entire surplus envisaged for Yugoslavia. This most directly speaks about mobilized associated labor which did not give way in the most sensitive segment of the Yugoslav economy. This year exports--that is, Slovene exports to convertible currency markets--will grow by 10 and 15 percent respectively.

It is estimated that by the end of the year personal incomes per each employee will in real terms be up by 3 percent. This growth is higher than is planned in the resolution and it increases with the growth of expenditure.

Pressures for price increases caused enough difficulties within the framework of social activities and the most complex are problems in some secondary schools which have no possibility of earning their income in direct exchange of labor.

At the meeting reference was made to preparations for a public discussion on the draft report by the Slovene LC Central Committee on the work of the LC between the 9th and 10th Slovene LC Congresses, as well as to preparations for electoral conferences of the basic organizations of the LC and municipal conferences of the Slovene LC. It was stressed that the discussion should reflect situations in particular environments and at the same time should give clear instructions for further activity.

The question of social and class structure as well as changes in membership should be comprehensively approached in the entire LC. It was said that the number of LC members is stagnating and in the past 3 years it has been decreasing. Though young people constitute two-thirds of the members, the young generation is becoming less and less represented and the LC is growing older. At the same time the number of workers from immediate production is

stagnating--that is, decreasing--and there are many cases of striking off the records or resignations. Continuous admission primarily of young people into the ranks of the LC and then workers, together with continuous ideological differentiation must become an action of lasting duration. It is necessary to continue with the differentiation which started with the discussion on the conclusions of the 13th LCY Central Committee Session.

/6091

CSO: 2800/85

## BRIEFS

**MINING PRODUCTION FIGURES**--Belgrade, 13 Nov (TANJUG)--In October, Yugoslav miners produced 6.35 million metric tons of lignite, and of brown, and hard coal. This breaks the August production record of 6,304,244 metric tons of extracted coal. Coal production in October this year is up 9.8 percent over production in October last year. It is superfluous to mention the value of this effort for the work of the thermal power plants which, in view of the drought we have had for many months, have been "carrying" electric power generation and have made an essential impact on the stability of our electric power generation system. Over the past 10 months, a total of 56,589,000 metric tons of coal were extracted which is 2,558,000 metric tons of coal up on the January-October 1984 period, an improvement of 4.7 percent. However, it is difficult to suggest the exact amount of coal to be offered to the consumers to normalize supplies. [Summary] [Belgrade TANJUG Domestic Service in Serbo-Croatian 0945 GMT 13 Nov 85 LD] /6091

**NEW HOME COMPUTER PRODUCTION**--Belgrade, November 14 (TANJUG)--The Electronic Industry (EI) Factory for computers of Nis, Yugoslavia, has started the production of Pekom 32, a new type of house computer, designed as a whole by the EI. Involved is a middle-class computer with useful memory of 32 kilobites and attachments such as diskettes, printers and others. The new computer uses basic and can be applied in school teaching, in work with graphic design and while learning foreign languages. The EI is preparing a whole family of Pekoms in which the computer to follow will have the memory of 64 kilobites. It will also deliver complete sets with attachments needed, from monitors to cassette-recorders to home and foreign partners. [Excerpt] [Belgrade TANJUG in English 0126 GMT 14 Nov 85 LD] /6091

**NEW AIR ROUTES**--Rio de Janeiro, November 16 (TANJUG)--Yugoslav Air Lines--JAT, Yugoslavia's leading air transport company, will open five new international routes in 1986. JAT will operate twice-weekly on the Belgrade-Stockholm-Gothenburg route and once-weekly on the Belgrade-Dubai-Kuala-Lumpur-Singapore, Belgrade-Amman, Belgrade-Zagreb-Chicago, Belgrade-Ljubljana-Chicago and the Dubrovnik-Athens routes. The authorization to open the new routes was granted to JAT on Friday at a five-day International Air Transport Association (IATA) meeting in Rio de Janeiro to establish next year's schedules. The representatives of 128 airline companies--IATA members attended the IATA meeting. [Text] [Belgrade TANJUG in English 1019 GMT 16 Nov 85 LD] /6091

IRRIGATION EQUIPMENT FOR SYRIA--Ljubljana, November 16 (TANJUG)--The Agrostroj factory of Ljubljana, northwest Yugoslavia, has concluded a countertrade agreement under which it will deliver irrigation equipment worth 14 million dollars to partners in Syria. The equipment will be used for three irrigation systems in the country. In turn, Syrian partners will deliver phosphates, worth the same amount, to the Yugoslav market. Talks between Agrostroj representatives and Syrian partners on technology transfers for the construction of a factory producing irrigation apparatus are currently underway. [Text] [Belgrade TANJUG in English 1014 GMT 16 Nov 85 LD] /6091

EGYPTIAN ECONOMIC COOPERATION--Belgrade, Nov 16 (TANJUG)--Industrial co-production projects involving a number of Yugoslav and Egyptian firms have opened up prospects for the rapid promotion of trade and overall economic cooperation between the two countries. The IMR enterprise of Belgrade is co-producing medium-sized tractors with Egypt's Nasco Company, while Crvena Zastava of Kragujevac, Vozila of Nova Gorica and Gosa of Smederevska Palanka are manufacturing automobiles and truck trailers with Egyptian partners. Industrial products make up the bulk of Yugoslav exports to Egypt. The most important items are steel, vehicles equipment and machinery, wood products, cement, pharmaceuticals and other products. Cotton, oil and oil derivatives are the main imports from Egypt. Bilateral trade in the first six months of the year totalled 108.6 million dollars, with Yugoslav exports accounting for 89.9 million and imports from Egypt for 18.7 million. Under contracts which have already been signed, the two countries' trade this year will value some 250 million dollars. [Excerpts] [Belgrade TANJUG in English 0301 GMT 16 Nov 85 LD] /6091

BOSNIA-HERCEGOVINA INDUSTRIAL PRODUCTION--Sarajevo, 16 Nov (TANJUG)--Industrial production in Bosnia-Herzegovina in 10 months of this year is up by 5.5 percent compared to the same period last year. Production in October in relation to the same month last year, is 3.5 percent greater and in relation to average monthly production in the previous year, it is up by 14.4 percent. According to figures of the Republic Statistics Institute, the largest growth in production was achieved in instruments of labor, up by 14.2 percent, and in materials for reproduction--up by 4.8 percent, while the production of consumer goods rose by 3.1 percent. [Excerpt] [Belgrade TANJUG Domestic Service in Serbo-Croatian 1055 GMT 16 Nov 85 LD] /6091

ELECTRONIC INDUSTRY EXPANSION--Nis, November 16 (TANJUG)--Over the next five years, around 15 billion dinars (some 50 million dollars) will be invested in the Elektronska Industrija (EI) of Nis, southeast Yugoslavia. The funds will be used to expand the industry's production capacities. Nineteen factories employing over 1,500 workers and specialists will be built. The new factories will enable the industry to play its part in the so-called third technological revolution and the development of micro-electronics. [Word indistinct] micro-electronics production programme, the new factories will also develop the production of electro-medical apparatus, household appliances, cable television aeriels, electronic programmers, and radio components. The electronic industry has over 10 specialized factories, which will deliver television sets, X-ray machines and household appliances,



teleprinters and other products worth around 90 million dollars to the foreign market this year. [Text] [Belgrade TANJUG in English 1010 GMT 16 Nov 85 LD] /6091

ITALIAN-YUGOSLAV ECONOMIC COOPERATION--Rome, November 22 (TANJUG)--Promotion of industrial cooperation and joint investments is the main result of an agreement reached today at the close of an Italy-yug-yugital chamber session in Milan. It was also agreed at the session to activate credit lines for greater usage of Italian credits in Yugoslavia. The Yugoslav side indicated an early elimination of barriers which have effected a decline in local border economic cooperation. The two-day talks attended by 250 representatives of Yugoslavia and Italy were also of a formal nature, marking the 30th anniversary of the Italy-yug-yugital chamber, which has made a major contribution to the promotion of economic cooperation between the two countries. [Text] [Belgrade TANJUG in English 1621 GMT 22 Nov 85 LD] /6091

DEBT TO BELGIUM RESCHEDULED--Brussels, November 22 (TANJUG)--Yugoslav and Belgian Government representatives today signed an agreement on rescheduling the principal of Yugoslavia's 735-million-Belgian-Franc debt, which falls due in May next year. After the talks held in Brussels, department head in the Yugoslav finance secretariat Nikola Jelic and director-general of the Belgian Office National Du Ducroire Willy Bus signed an agreement on a credit for refinancing the Yugoslav debt over a ten-year period. In addition to the inter-state agreement, an inter-bank agreement was also signed between the Bank of Ljubljana--Associated Bank, on the one side, and the Societe Generale De Banques and Banque Bruxelles Lambers on the other, as representatives of the two governments. [Text] [Belgrade TANJUG in English 1630 GMT 22 Nov 85 LD] /6091

YUGOSLAV-FRENCH ECONOMIC COOPERATION--Belgrade, November 23 (TANJUG)--Trade between Yugoslavia and France this year will reach 550 million dollars, thus recording a considerable decline compared with the exchange of goods and services over the past five years. The mutual deliveries in 1979 amounted to 938 million dollars. Automobile tires, cotton fabrics, unrefined aluminium, household appliances, automobiles, footwear and furniture make up the bulk of Yugoslav exports. Under the long-term agreements on cooperation in production between Yugoslav and French firms--IMV and Renault, Cimos and Citroen, UPM and Peugeot--the Yugoslav export of automobiles and parts this year is to reach 48 million dollars. From France, Yugoslavia imports largely machines, conveyance equipment and chemicals to meet the needs of the home market. Among the measures being taken by businessmen in the two countries to encourage broader cooperation, interest centres especially on joint undertakings in construction industry. Consultations are under way on the opening of a Yugoslav construction centre in Paris which is to help realize a number of joint Yugoslav-French projects on markets in third countries. [Text] [Belgrade TANJUG in English 0122 GMT 23 Nov 85 LD] /6091

CSO: 2800/85

END

**END OF**

**FICHE**

**DATE FILMED**

16 January 1986